ESTABLISHED 1850

The Defiance Machine Works

INVENTORS AND BUILDERS OF

Patent Wood Working Machinery

DEFIANCE ~ OHIO
UNITED STATES OF AMERICA

CATALOGUE
Nº. 200.

No. 50

WITH COMPLIMENTS OF

THE DEFIANCE MACHINE WORKS

DEFIANCE, OHIO, U. S. A.

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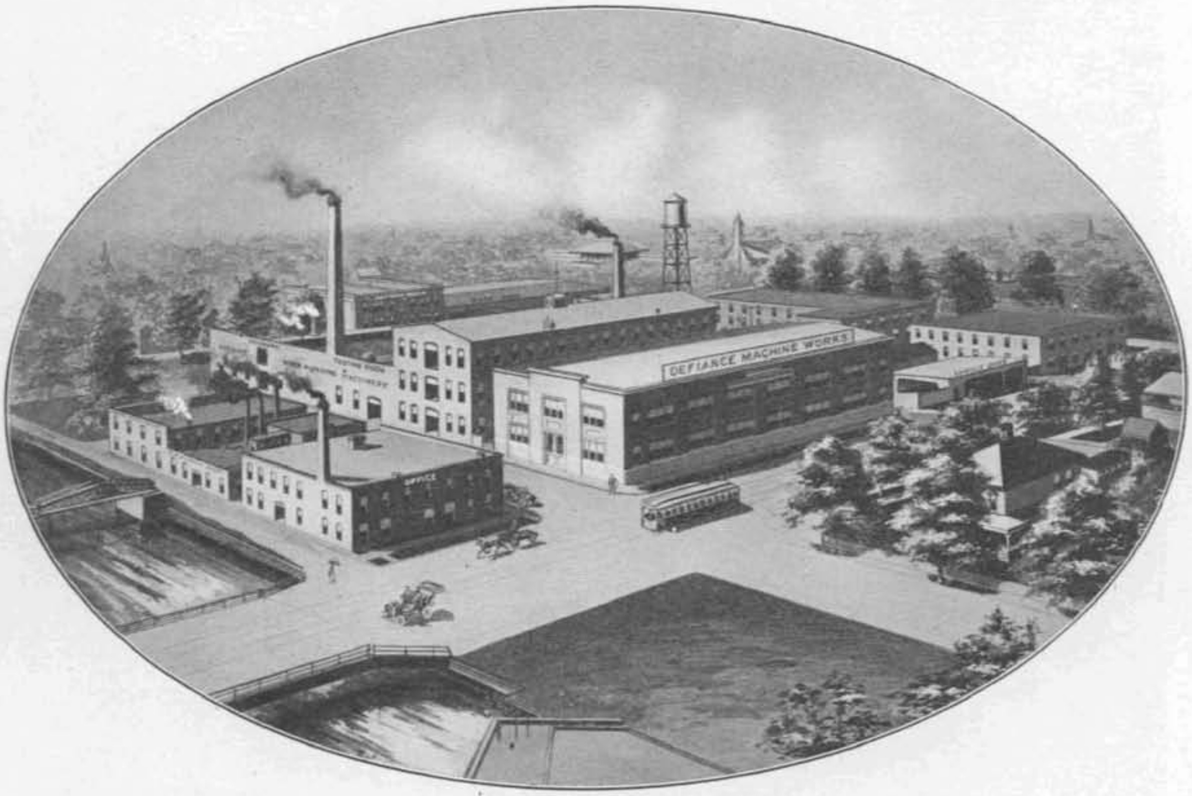
ILLUSTRATED

DESCRIPTIVE CATALOGUE

PATENT LABOR-SAVING

WOOD-WORKING MACHINERY



INVENTED AND MANUFACTURED BY

THE DEFIANCE MACHINE WORKS

ESTABLISHED 1850

DEFIANCE, OHIO, U. S. A.

No. 200

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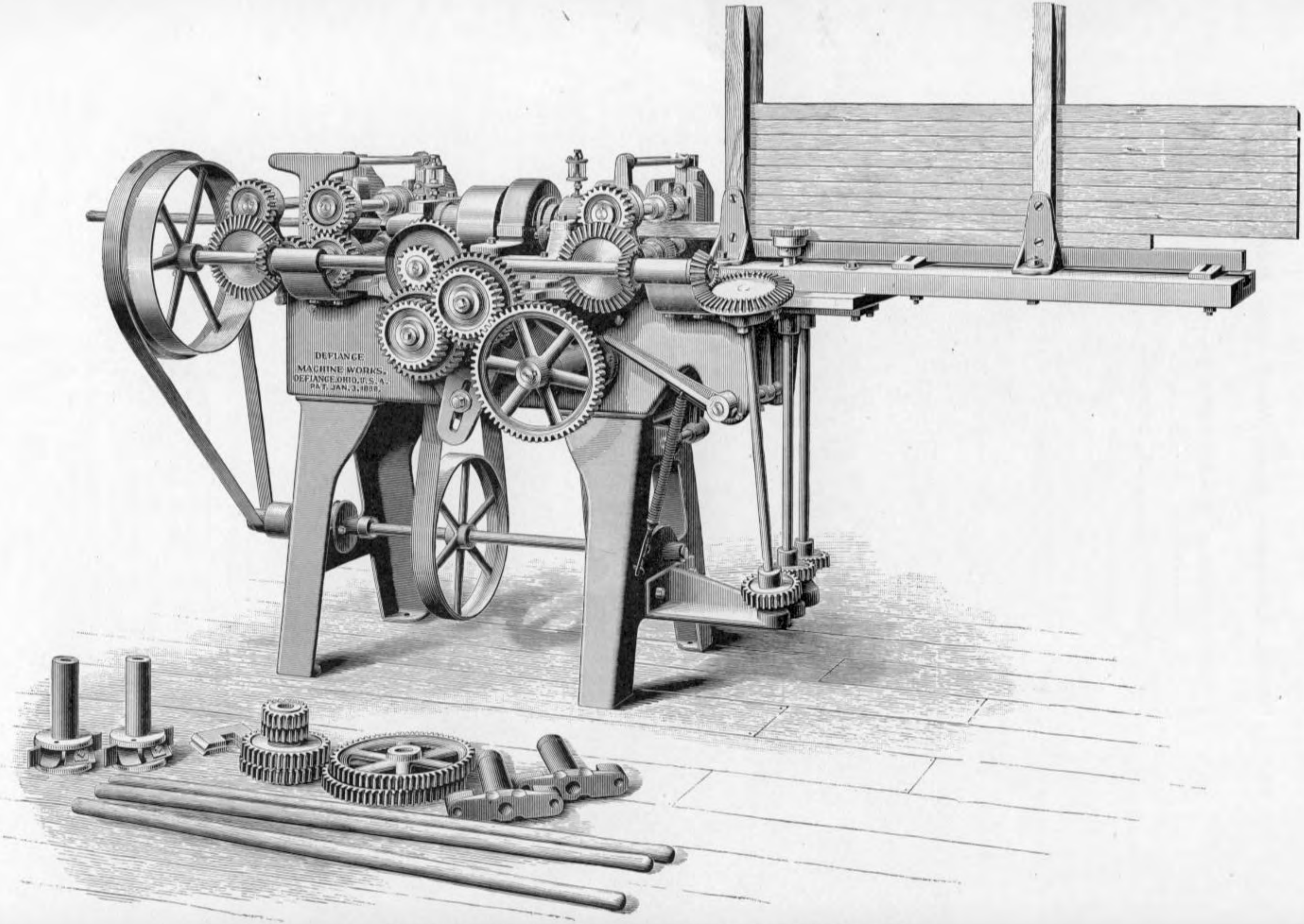
TO OUR PATRONS AND FRIENDS
IN ALL COUNTRIES,
AND ALL PROGRESSIVE MECHANICS
INTERESTED IN
LABOR-SAVING WOOD-WORKING MACHINERY,
THIS VOLUME IS
RESPECTFULLY DEDICATED.

THE DEFIANCE MACHINE WORKS,
DEFIANCE, OHIO,
UNITED STATES OF AMERICA.

Announcement.

ANY of the Machines illustrated in this Catalogue of Labor-Saving Machinery can be purchased of the undersigned, or their authorized agents. Every Machine is thoroughly tested by skillful mechanics, and the work expected of them accurately performed in our special testing rooms before the Machines are shipped, and when received by the purchaser they are all adjusted and ready for work when the power is applied. Every Machine is guaranteed to perform as represented, and is unsurpassed in the saving of labor.

THE DEFIANCE MACHINE WORKS,
Defiance, Ohio, U. S. A.


DEFIANCE
MACHINE WORKS.
DEFIANCE,OHIO,U.S.A.
PAT. JAN. 3, 1888.

The Chaplin Patent Automatic Handle Lathe.

The Chaplin Patent Automatic Handle Lathe.

Export Shipping Weight, 1,900 Pounds.
Net Weight, 1,400 Pounds.
Cubic Measurement, 67 Feet.
Cable Word, LAURA.

THIS ENGRAVING represents the Chaplin Patent Automatic Handle Lathe, used for rapidly and accurately making broom, rake, fork, hoe, and other round handles, including stems for D Handles as well as curtain and pike poles, flag poles, fishing rods, billiard cues, Vienna bent chair backs, and various other wooden articles, either straight or tapering, making a straight taper full length, or taper and straight on the same piece, or for turning swell work.

IT IS the first successful attempt at producing an automatic turning lathe for this class of work. It will turn from ¼″ diameter up to 1$\frac{13}{16}$″ diameter, and from 30″ long up to any length, having a hollow spindle through which the material to be turned is fed, and not depending upon centers to hold the work as by the old class of turning lathes. Material 60 feet long can be turned if desired.

ITS CAPACITY is sufficient to turn about 8,000 broom handles in ten hours, either from hard or soft wood, and produce smooth and true work, making pieces of one kind to exact size and shape.

THE FRAME, of iron, is heavy and substantial with a broad floor base, with the working parts, including a suitable table for the support of the material, mounted upon it.

THE CUTTER HEAD SPINDLE, of large diameter, runs in long bearings, and it is equipped with two cutter heads; the first, a roughing head which reduces the handle square to the smallest diameter at which it will finish, leaving a small surplus for the second or finishing head, which is located behind the rougher. The finishing head contains expanding knives which are opened and closed by the aid of a cam driven by cut gearing for turning taper or swell work, requiring a cam for each different design or shape of handle. The cams and gears are numbered for different classes of work, and, by following the chart which we furnish, the machine can be quickly adjusted from one class of work to another.

THE FEED is driven by cut gearing and it is very powerful, with two changes of speed for small and large work. Eight feed rollers are employed, four in front and four behind the cutters, to feed the material in and out of the machine. The two vertical rollers located at the table automatically receive the material from the table and feed it forward to the V shaped horizontal rollers which carry it through the cutter heads and clear of the machine.

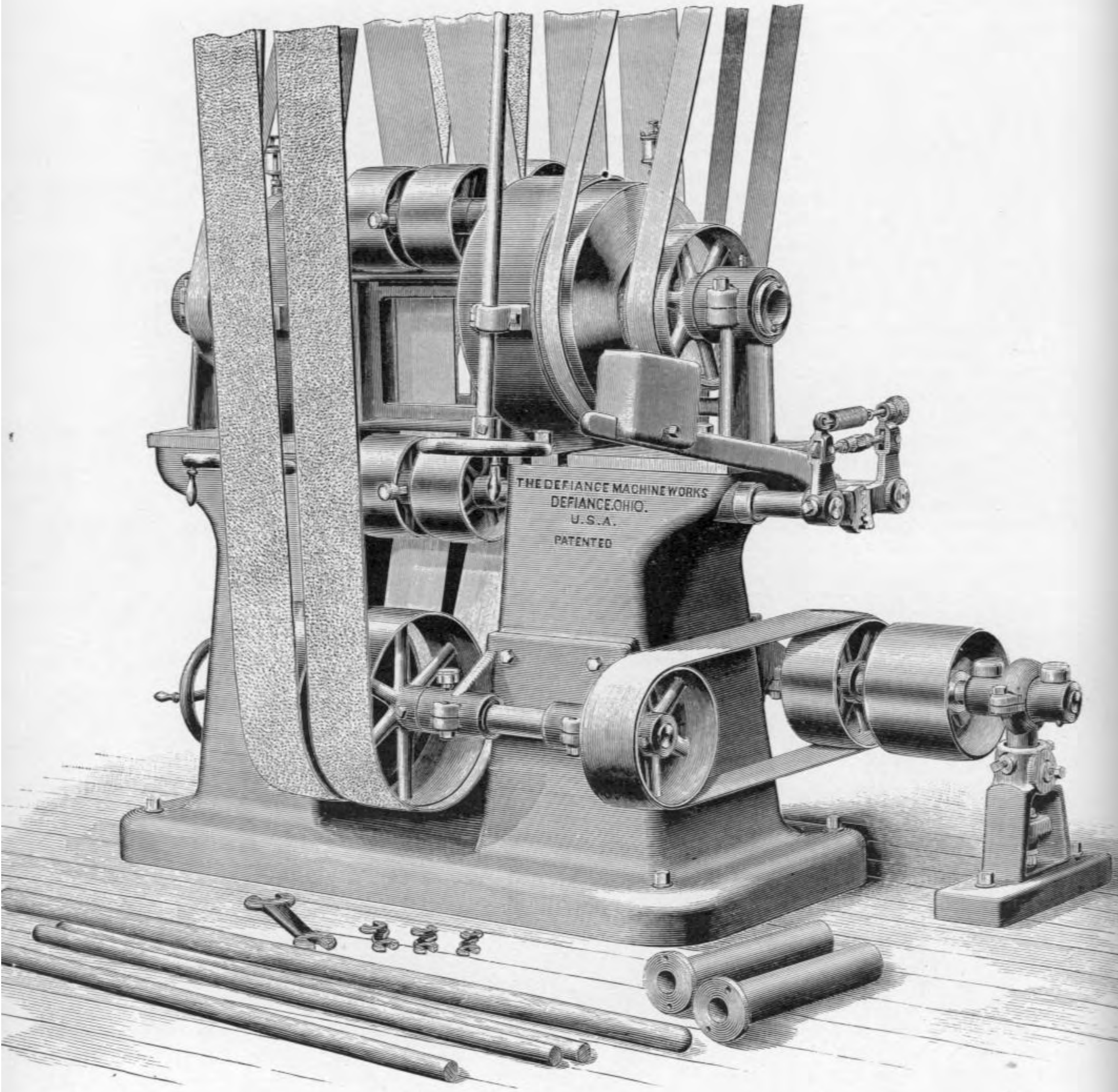
THE MATERIAL to be turned is placed into the rack on the table, which is capable of holding a number of pieces at one time, and the vertical feed rollers open and close automatically at the proper time to receive and feed forward the bottom piece, which when fed through allows the next piece to take its place upon the table, when the feed rollers again close in and repeat the operation, and so continue, keeping the machine constantly supplied with work.

ALL THE MOVEMENTS are automatic. It is simply necessary for the operator to place the stock to be turned into the rack and the finished product is discharged at the rear of the machine.

PREVIOUS TO ITS INTRODUCTION the material was handled twice, first to place it between the centers, and second to remove it when finished. The entire work is now accomplished by the use of this automatic machine at one and the same time; ten times more rapidly, much more smoothly, and more uniformly turned. It is an indispensable machine to manufacturers in this line.

THE COUNTER is furnished as follows: Shaft 1$\frac{15}{16}$″ × 48″ long; two No. 2 ball and socket adjustable hangers; driving pulley, 30″ × 4″; tight and loose pulleys, 14″ × 5″; speed, 700 rotations per minute.

HORSE POWER to drive, 4; floor space occupied, 45″ × 96″.


THE DEFIANCE MACHINE WORKS
DEFIANCE, OHIO.
U.S.A.
PATENTED

No. 2 Patent Automatic Handle Polishing Machine.

Export Shipping Weight, 3,400 Pounds.

Net Weight, 2,800 Pounds.

Cubic Measurement, 93 Feet.

Cable Word, PIANO.

No. 2 Patent Automatic Handle Polishing Machine.

Export Shipping Weight, 3,400 Pounds.
Net Weight, 2,800 Pounds.
Cubic Measurement, 93 Feet.
Cable Word, PIANO.

THIS ENGRAVING represents our No. 2 Patent Automatic Handle Polishing Machine, which is used for rapidly and accurately polishing broom, rake, fork, hoe, and other round handles, curtain poles, pike poles, and other round turned work, from ½″ up to 2″ diameter, and from 24″ up to any length.

THE FRAME, of neat design, is heavy and well proportioned. It is cast in one piece with cored center and a broad floor base to stand firm, overcoming jar or vibration.

THE FEEDING MECHANISM is an ingenious device. It receives the handles to be polished, rotates and feeds them forward between the polishing belts at a speed sufficient to finish about 10,000 handles 42″ long in ten hours, and other lengths in proportion. All the gears are cut to insure a steady motion to the feed, and they, with their working parts, are thoroughly inclosed in iron cases to exclude dust or dirt.

THE FOUR POLISHING BELTS are flexible and stand vertically, two on each side of the work to be polished. They are 5″ wide and provided with strainers to keep them to the proper tension. This adjustment is secured by two convenient hand-wheels, shown on either side of the polishing belts. They can also be instantly adjusted to or from each other for small or large work and to secure the proper contact with the work. These several adjustments are made while the machine is in motion.

ITS ADVANTAGES over other machines for this work are many. The four polishing belts are of extra length, running from the machine to a counter attached to the ceiling, which secures a large amount of wearing surface. The first two belts are covered with rather a coarse polishing material, and the other two immediately behind them with a very fine sand, so that handles which are imperfectly turned can be fed through the machine and made true and smooth. Operators of handle-turning lathes do not always keep their machines in proper condition to do smooth work, consequently with this new polisher such handles are converted into No. 1 stock. On the other hand, for smoothly turned work the first two belts should be provided with fine sand and the other two with wax, so that the polishing and waxing can be accomplished at one pass of the work through the machine. All belts can be placed on or off the machine without disconnecting any of the parts.

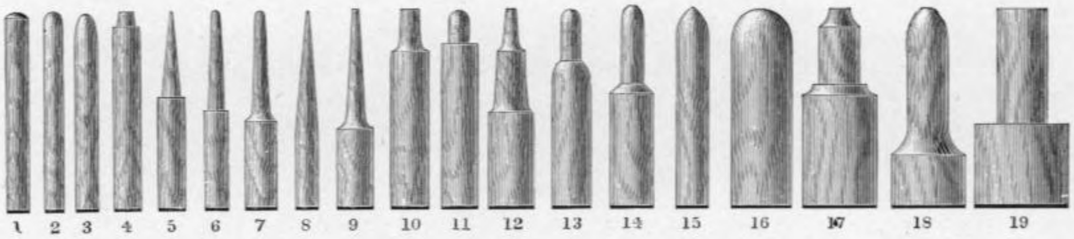
ALL THE WEARING SURFACES are fitted with the greatest care. All the journal boxes are lined with genuine babbitt metal and equipped with self-oiling, dust-proof cups. The loose pulleys are fitted with bronze bearings and self-oiling devices.

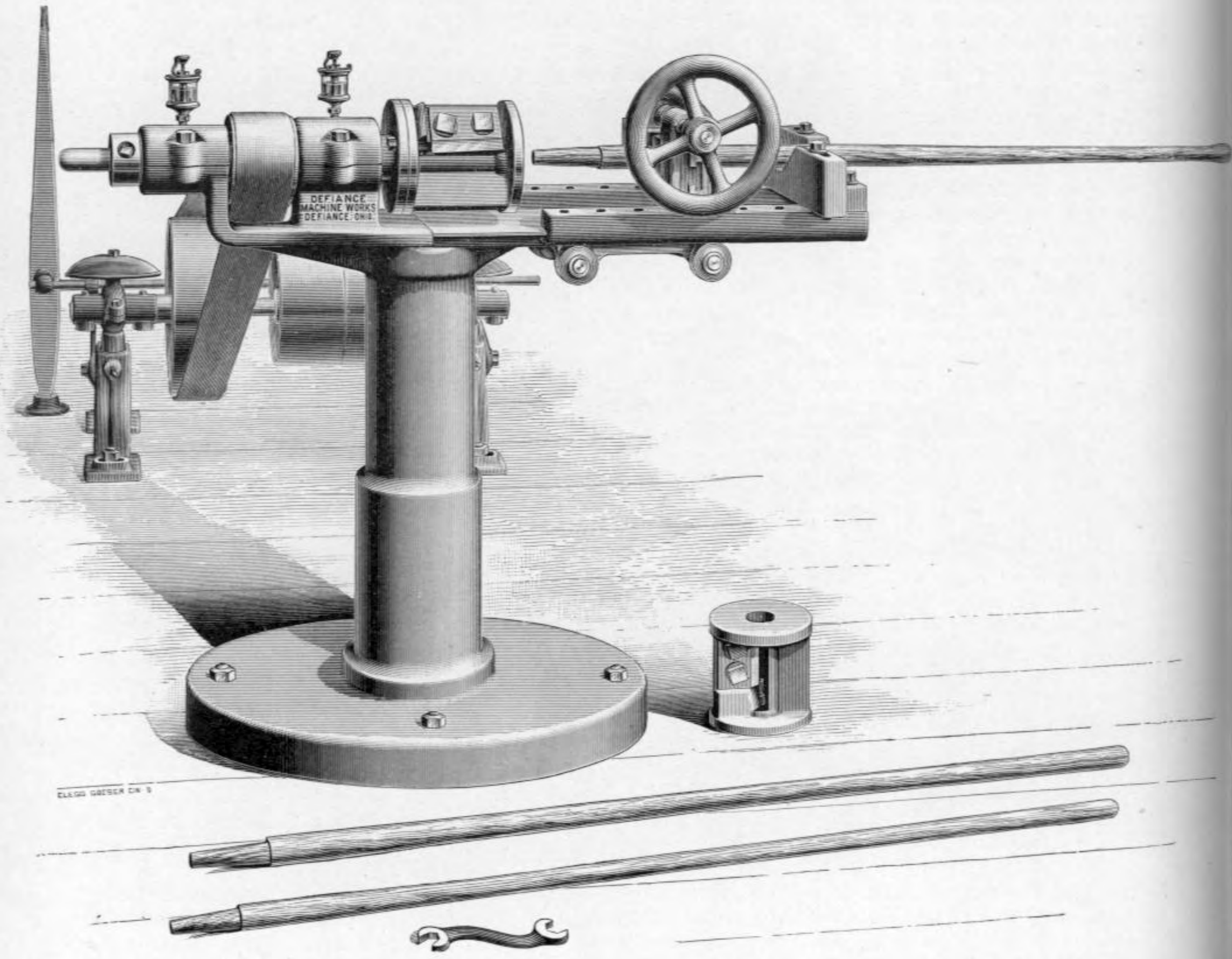
THIS MACHINE can be handled successfully by unskilled labor, as it is entirely automatic in its movements. The work to be polished is simply fed into the machine, the feeding rolls carrying it between the polishing belts and clear of the machine, as live rolls are used on both sides of the belts, consequently a continuous line of work can be kept going through the machine and the work produced by it will be of a superior quality.

IN ORDERING give the height of the ceiling of the room in which this machine is to be used, and also state the diameter of the work to be polished.

THE COUNTER is furnished as follows: Shaft, 1 15/16″ × 72″; two No. 2 ball and socket adjustable drop hangers; one driving pulley, 26″ × 6″; tight and loose pulleys, 14″ × 6″; two pulleys, 5¼″ × 3″, for driving the loose gears; two pulleys, 4″ × 3″, for revolving the feed heads; one floor stand, 12″ high; speed of tight and loose pulleys, 450 turns per minute.

HORSE POWER to drive, 5; floor space occupied, 34″ × 90″.




DEFIANCE MACHINE WORKS DEFIANCE, OHIO.

No. 1 Improved Chucking and Tenoning Machine.

Export Shipping Weight, 1,000 Pounds.

Net Weight, 600 Pounds.

Cubic Measurement, 22 Feet.

Cable Word, CLEVELAND.

No. 1 Improved Chucking and Tenoning Machine.

Export Shipping Weight, 1,000 Pounds.

Net Weight, 600 Pounds.

Cubic Measurement, 22 Feet.

Cable Word, CLEVELAND.

THIS ENGRAVING represents a very comprehensive Chucking and Tenoning Machine designed to answer for a much larger range of uses than ordinary machines of this type, and it is recommended for cutting round tenons from $\frac{1}{8}''$ up to 3″ diameter any length, either parallel or tapering, with square, beveling, or round shoulders, or for rounding the ends of handles, etc., as shown by the engravings representing samples of work as produced by the machine.

THE SPINDLE is of large diameter and fitted with a $1\frac{3}{16}''$ hole extending through it, which permits tenons of any length to pass through the head. A suitable adjustable gauge is fitted into the hole through the spindle, for the purpose of gauging the length of cut.

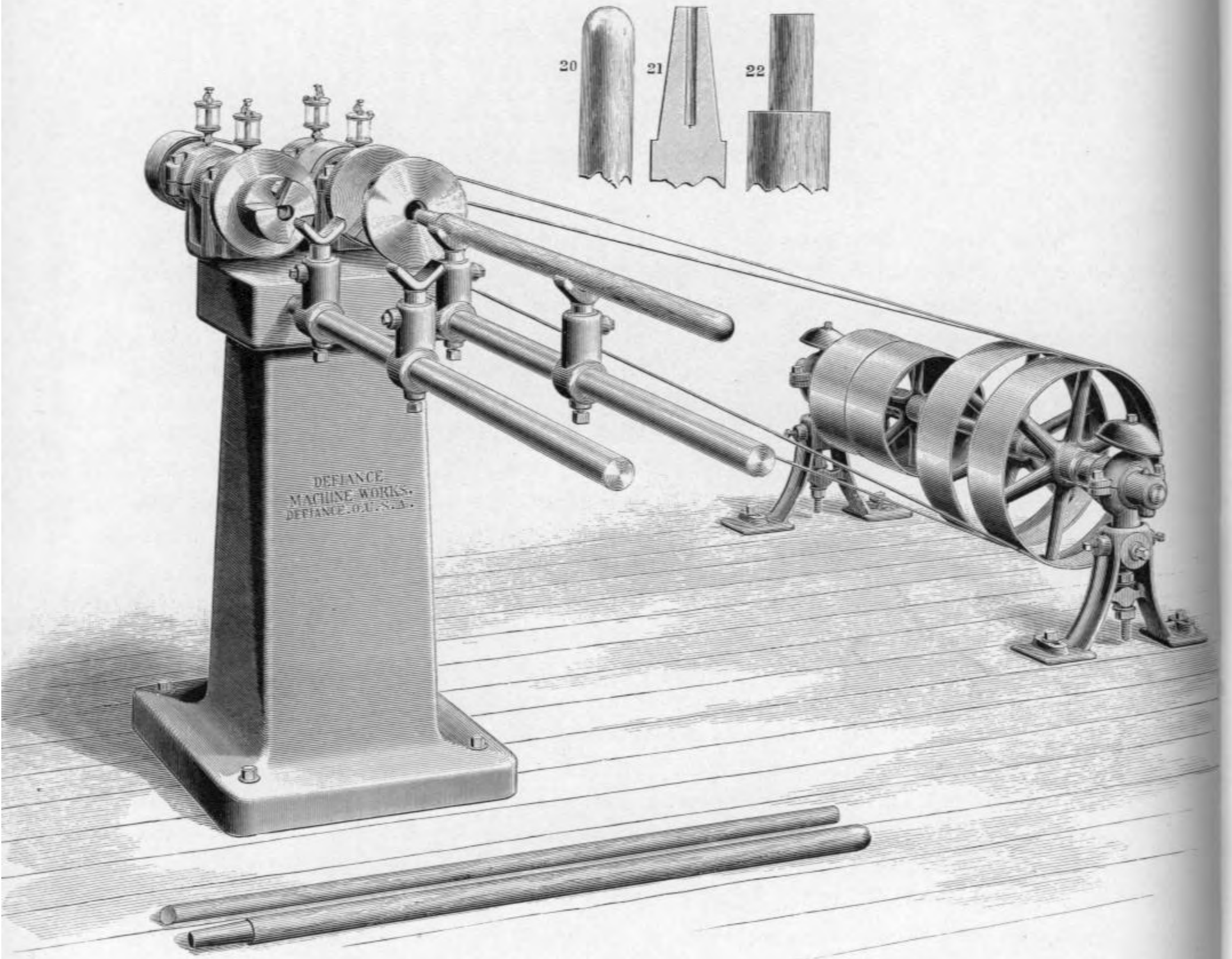
THE CUTTER HEADS for this machine can be quickly placed on or removed. A separate head is required for each of the several shapes as shown by the engravings. Heads for other shapes can be supplied if desired.

THE TABLE is fitted to the frame in planed angle ways and it rides upon friction rollers. All the surfaces are nicely fitted, allowing the table to slide to and from the cutter head with the greatest ease. The work to be operated upon is held at one end by self-centering jaws propelled by right and left hand screws operated by hand-wheel, which holds the work firmly and centrally with the cutter head. It is quick in its operation and very accurate.

THIS MACHINE is thoroughly built throughout, with large substantial bearings, and adapted to a range of work reached by no other machine of its class.

THE COUNTER is furnished as follows: Two No. 1 ball and socket adjustable drop hangers; one belt shipping apparatus complete; countershaft, $1\frac{7}{16}'' \times 36''$ long; driving pulley, 15″ × 4″; tight and loose pulleys, 10″ × 5″; speed, 1,000 rotations per minute; pulley on machine, 5″ diameter 3″ face; speed, 3,000 rotations per minute.

HORSE POWER to drive, $\frac{1}{2}$; floor space occupied, 24″ × 40″.



No. 2 Improved Double Spindle Chucking and Boring Machine.

Export Shipping Weight, 1,100 Pounds.

Net Weight, 800 Pounds.

Cubic Measurement, 22 Feet.

Cable Word, CONE.

No. 2 Improved Double Spindle Chucking and Boring Machine.

Export Shipping Weight, 1,100 Pounds.
Net Weight, 800 Pounds.
Cubic Measurement, 22 Feet.
Cable Word, CONE.

THIS ENGRAVING represents an improved Double Spindle Chucking and Boring Machine, with one of its spindles fitted with a cutter head for rounding the end of handles, as shown by engraving No. 20; the other spindle is provided with a cutter head for cutting tenons, similar to No. 21 or No. 22, and it is arranged to bore the end of handles at the same time the tenon is cut; cutter heads of different sizes and shapes can be used for various classes of chucking and tenoning.

IT IS a most complete and convenient machine for handle making, as the rounding, tenoning, and boring of handles can be accomplished at one handling without stopping the machine or changing heads, which is necessary with a single head machine.

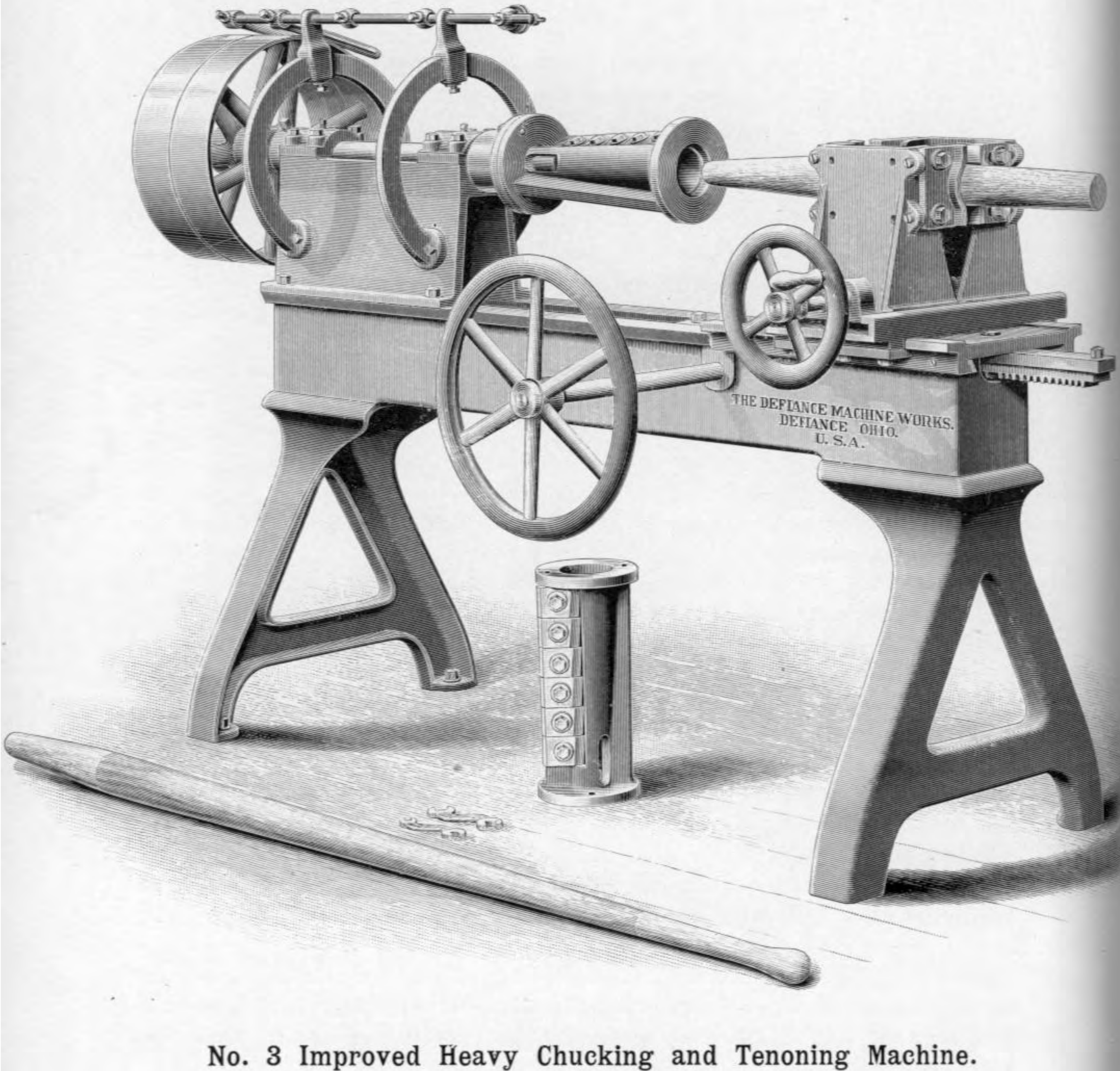
THE CUTTER HEAD SPINDLES are large in diameter and have a $1\frac{3}{16}''$ hole extending through them so that tenons of any length can be cut, or long rods, such as curtain poles, etc., can be fed through the machine. A gauge plug is fitted into each hole in the spindles, and they are used when cutting tenons for regulating the length of cut.

A SELF-CENTERING REST is provided for each cutter head, into which the material to be operated upon is placed and held true with the cutters, requiring no care on the part of the operator to properly place the material into the machine.

THIS MACHINE is constructed on a substantial iron frame cast in one piece with cored center; it is provided with large wearing surfaces which are accurately fitted, and it is calculated to cover a larger variety of uses than any other machine of this class.

THE COUNTER is supplied as follows: Shaft, $1\frac{7}{16}''$ × 48″; two No. 1 ball and socket adjustable hangers; two driving pulleys, 15″ × 4″; tight and loose pulleys, 10″ × 5″; speed, 1,000 rotations per minute; size of pulley on cutter head spindles, 5″ × 4″; speed, 3,000 rotations per minute.

HORSE POWER to drive, 1; floor space occupied, 22″ × 72″.


THE DEFIANCE MACHINE WORKS.
DEFIANCE OHIO.
U. S. A.

No. 3 Improved Heavy Chucking and Tenoning Machine.

Export Shipping Weight, 1,400 Pounds.

Net Weight, 1,000 Pounds.

Cubic Measurement, 54 Feet.

Cable Word, CRESUS.

No. 3 Improved Heavy Chucking and Tenoning Machine.

Export Shipping Weight, 1,400 Pounds.

Net Weight, 1,000 Pounds.

Cubic Measurement, 54 Feet.

Cable Word, CRESUS.

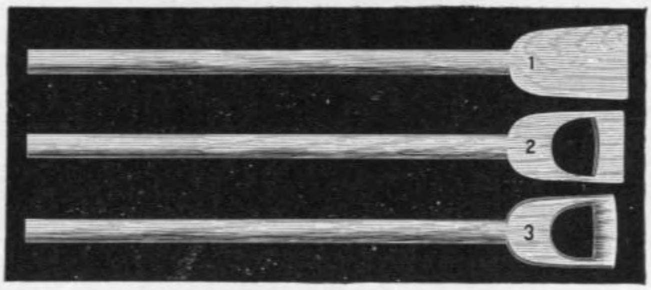
THIS ENGRAVING represents our No. 3 Improved Heavy Chucking and Tenoning Machine, especially designed for cutting tenons, pointing and rounding ends of cant hook levers, handles, stakes, and various other classes of turned woodwork. Cutter heads can be furnished to suit any requirement in this line, either for small or large work. It is capable of doing this class of work very rapidly and accurately.

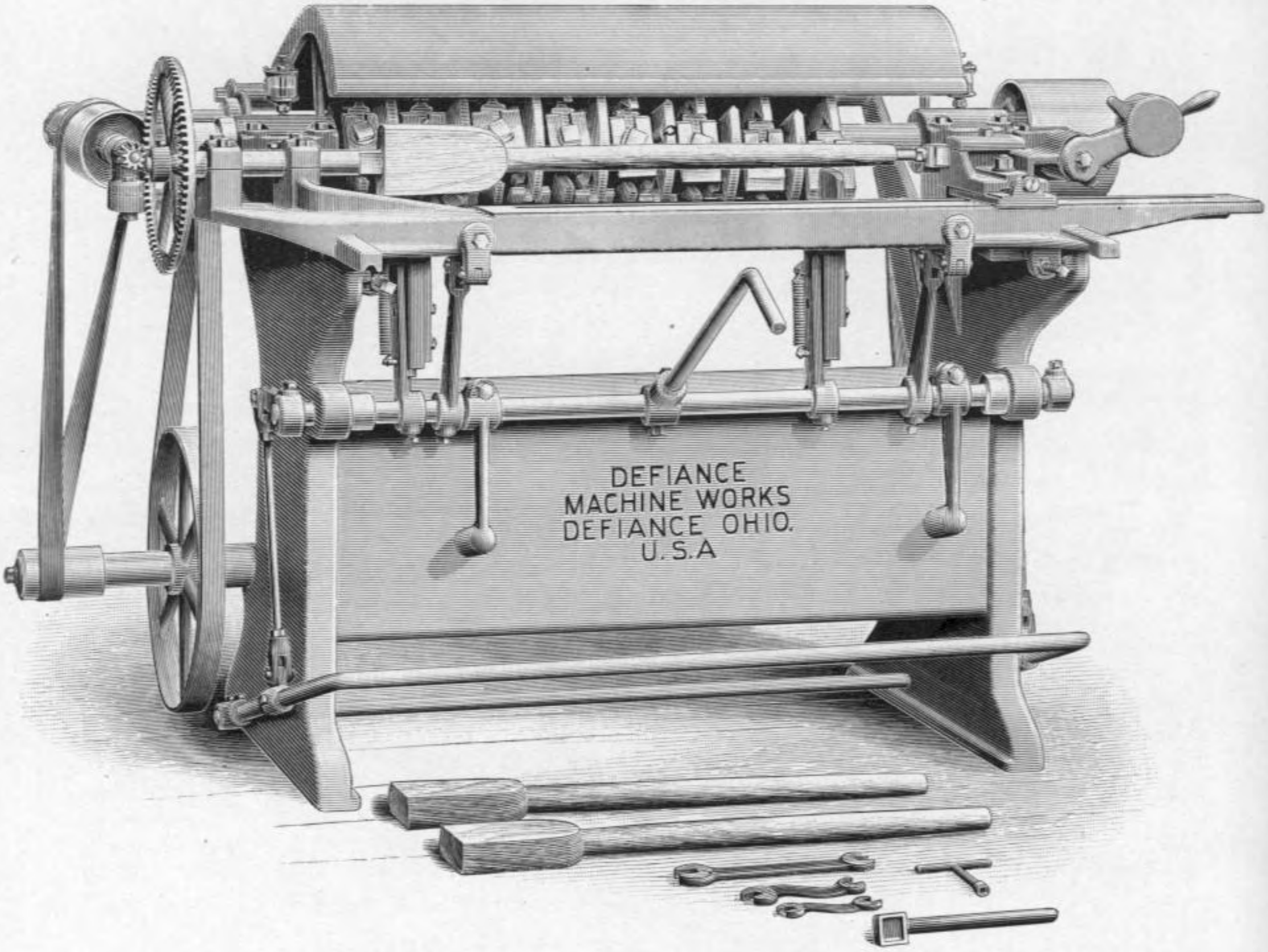
THE FRAME of this machine, of iron, is cast in one piece, with cored center, making it strong and durable, so that it will not spring, and get out of alignment, and it is provided with a broad floor base to stand firm. The cutter head spindle is extra heavy and it runs in long self-lubricating bearings with the tight and loose pulleys fitted to the outer end, and they are provided with our improved belt shipping apparatus for moving the belt in starting and stopping the machine. The cutter head is held in position on the front end of the spindle by two steel bolts so that they can be quickly placed on or off the machine. In the center of the tenon head, a stop gauge is fitted to regulate the depth of cut. The chuck for holding the work is self-centering. The jaws are propelled by a right and left hand screw operated by a convenient hand-wheel requiring no care on the part of the operator in placing material into the machine, as it always comes true with the cutter head.

THE CARRIAGE supporting the chuck is gibbed to the top of the frame in angle ways and it slides in a horizontal plane to and from the cutter head with the greatest ease by turning the large hand-wheel shown.

THE TIGHT AND LOOSE PULLEYS are 16″ diameter, 4″ face, and should run 600 turns per minute. They can be belted to from above, below, or either side.

HORSE POWER to drive, 1; floor space occupied, 24″ × 72″.





38″ Patent D Handle Turning Lathe.

Export Shipping Weight, 2,900 Pounds.

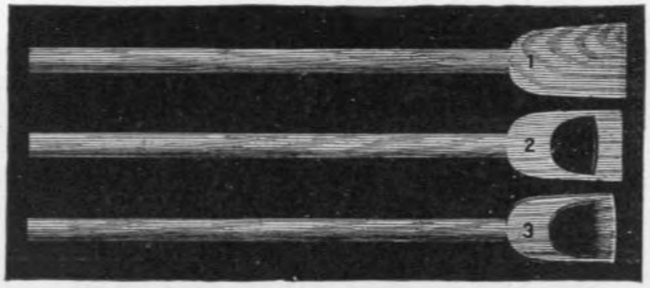
Net Weight, 2,400 Pounds.

Cubic Measurement, 84 Feet.

Cable Word, LUCITANIA.

38″ Patent D Handle Turning Lathe.

Export Shipping Weight, 2,900 Pounds.
Net Weight, 2,400 Pounds.
Cubic Measurement, 84 Feet.
Cable Word, LUCITANIA.



THIS ENGRAVING represents our latest and most improved 38″ Patent D Handle Turning Lathe, especially designed for turning D handles for shovels, spades and forks. It is so constructed that the rough handle blank is placed into the machine and turned its full length at one time, smooth and true, at the rate of about 2,500 handles in ten hours.

THE FRAME is a heavy casting, with cored center and a broad floor base to stand firm and to overcome any tendency to jar or chatter, and enable the machine to be crowded to its full capacity without injuring the working parts and produce smooth, clean turning.

THE CUTTER HEADS of large diameter are fitted to a ground steel spindle 2¼″ diameter, running in long bearings of the ring oiling reservoir type. Each head is fitted with three shear cutting knives and a sufficient number are used to cover the longest handle to be turned, forming a continuous cut over the entire length of the handle. Different lengths of handles can be made by simply adjusting the tail stock horizontally on the table, which is also provided with a right angular adjustment to turn the handle parallel or to any taper. The diameter of the handle can be varied quickly by adjusting two screws underneath and at each end of the table.

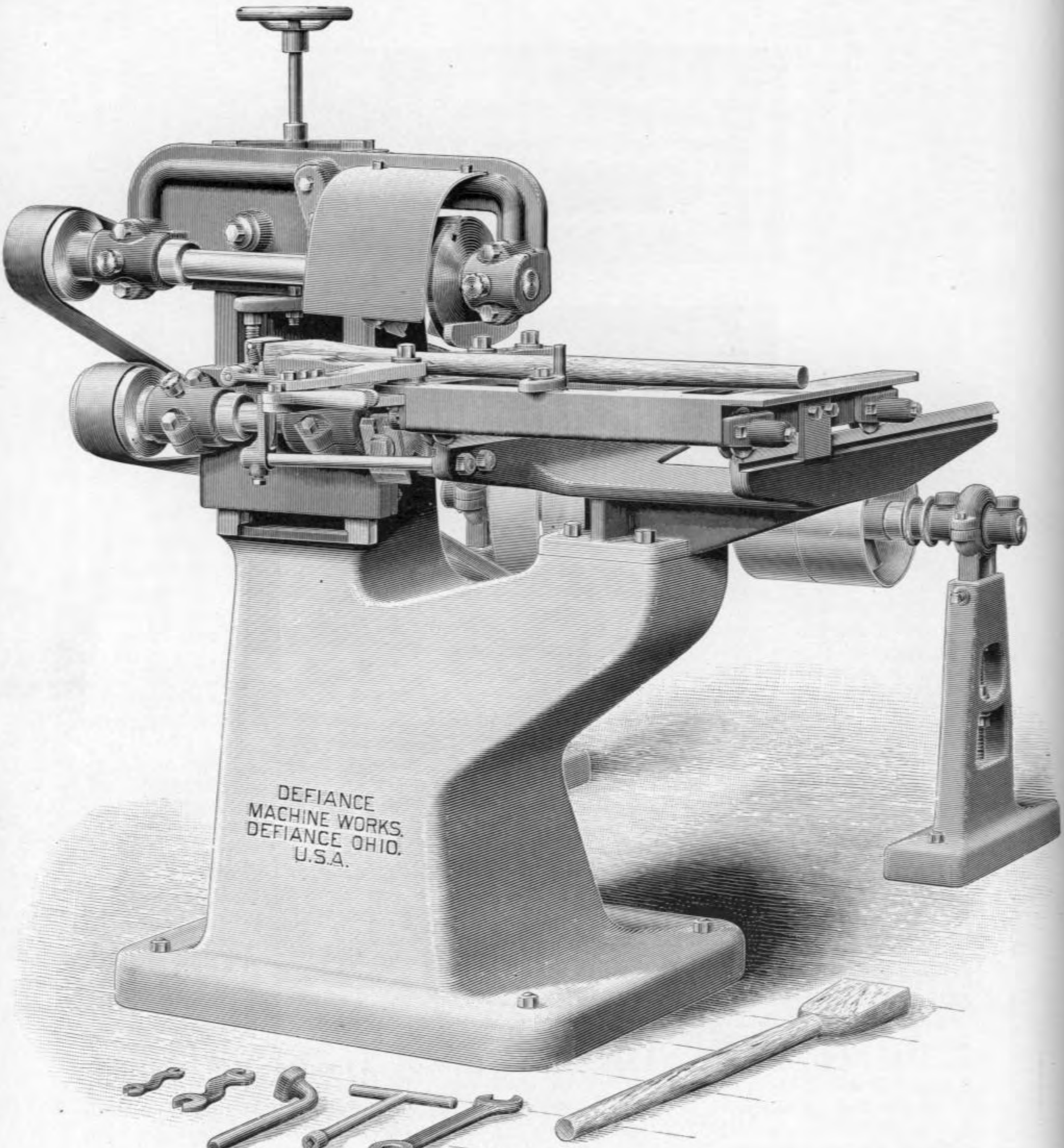
THE TABLE, carrying the centers which support the material to be turned, is moved to or from the cutters by the use of a combined foot and hand lever, and when moved up to the cutters to the point where the turning shall begin, the handle blank is slowly rotated automatically against the cutters until finished, after which it is moved back towards the operator, when the feed is self-released for the removal of the finished handle and the reception of another handle blank.

A SELF-CENTERING DEVICE is furnished which enables the handle blank to be placed in the machine accurately and rapidly without any care on the part of the operator.

SAMPLE HANDLE No. 1 shows the product as it comes from this machine; No. 2, after having been punched by a special machine for that purpose; No. 3, the complete finished handle, turned, punched, rounded and chamfered ready for the market.

THE COUNTER is furnished as follows: Shaft, 2³⁄₁₆″ diameter; two No. 2 adjustable drop hangers; one driving pulley, 30″ × 6″; one pair of tight and loose pulleys, 14″ × 6″; speed, 600 turns per minute. Pulley on the machine, 8″ diameter × 6″ face.

HORSE POWER to drive, 5; floor space occupied, 38″ × 82″.


DEFIANCE
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DEFIANCE OHIO.
U.S.A.

No. 21 Combined D Handle Jointing and Backing Machine.

Export Shipping Weight, 2,150 Pounds.

Net Weight, 1,650 Pounds.

Cubic Measurement, 83 Feet.

Cable Word, JEWEL.

No. 21 Combined D Handle Jointing and Backing Machine.

Export Shipping Weight, 2,150 Pounds.
Net Weight, 1,650 Pounds.
Cubic Measurement, 83 Feet.
Cable Word, JEWEL.

THIS ENGRAVING represents our No. 21 Combined D Handle Jointing and Backing Machine, which has been designed for the use of D handle makers, such as used for shovels, spades and forks. It joints and finishes complete both flat sides of the handle to the correct shape at one pass through the machine, doing the work smooth and true, entirely avoiding hand finishing, at the rate of about 5,000 handles in ten hours, with unskilled labor to operate it. Previous to the introduction of this machine this work was finished by two separate operations.

THE FRAME is a heavy casting in one piece, with cored center, with a broad floor base to stand firm. It is of sufficient strength to properly support the working parts and keep them in perfect alignment, and produce a smooth, clean cut in the hardest wood.

THE CARRIAGE is supported upon non-friction wheels, which travel upon planed V shaped tracks, and is fitted with gibs at each end. It runs exceedingly light and easy and cannot raise from the tracks or chatter. The top of the carriage is fitted with a system of stops and gauges so that the operator can quickly place the handle into the machine in the correct position without care or trouble

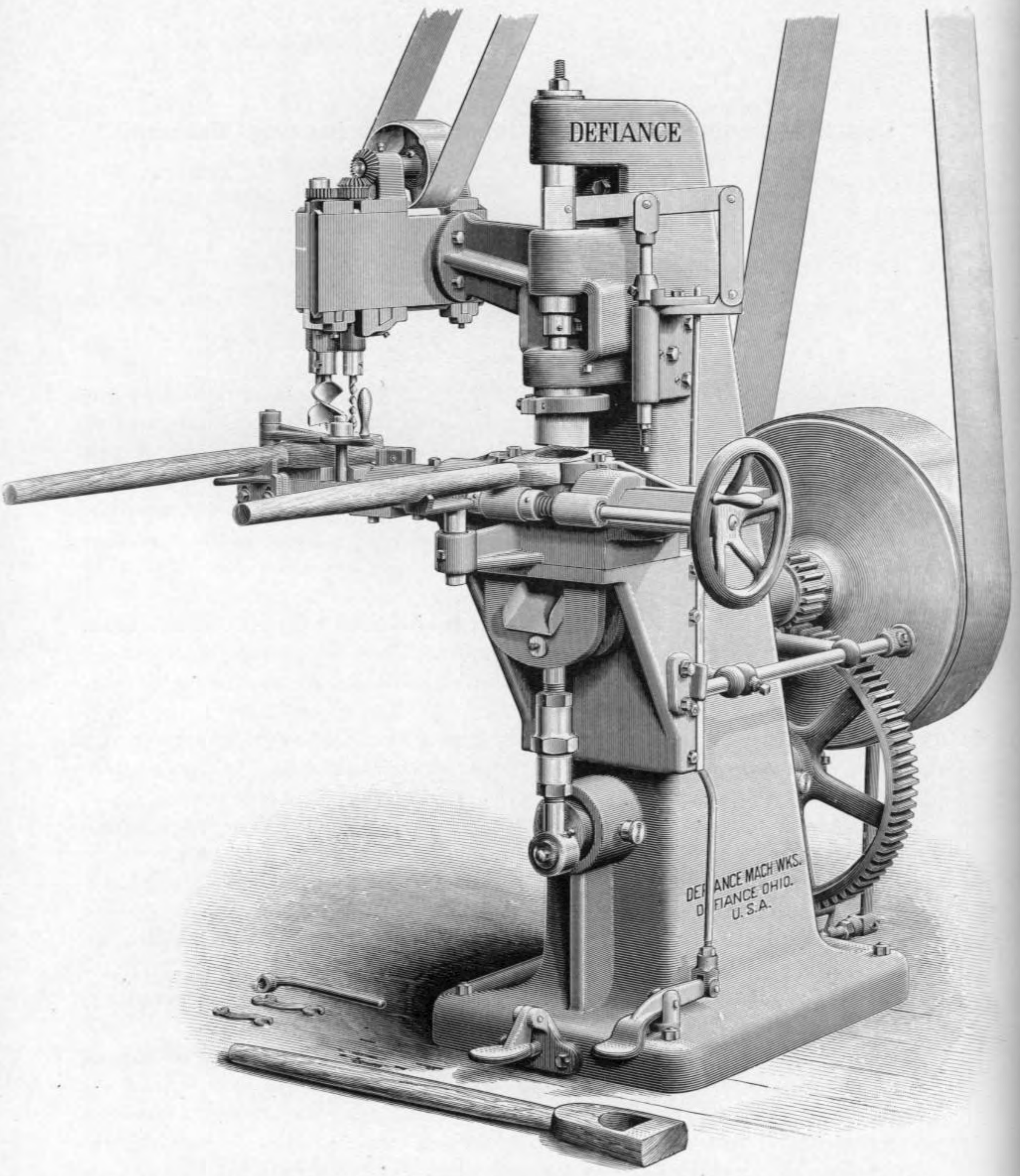
THE SADDLES supporting the cutter head spindles are gibbed to the upright and are adjustable vertically by convenient hand screws for handles of different thickness.

THE CUTTER HEAD SPINDLES are ground steel of large diameter and they rotate in genuine babbitt metal self-lubricating bearings.

THE CUTTER HEADS are equipped with shear cutting knives capable of cutting the hardest dry stock smooth and true without lifting the fiber, the lower head making a straight or parallel cut while the upper one is automatically oscillated and produces an oval shaped cut. A shield surrounds the upper head to protect the operator.

THE COUNTER is furnished as follows: Shaft, 1$\frac{11}{16}$″ × 48″; two ball and socket floor stands 36″ high; two driving pulleys, 16″ diameter × 4″ face; one pair of tight and loose pulleys, 10″ × 5″; speed, 1,200 rotations per minute; with the loose pulley fitted with bronze bearings.

HORSE POWER to drive, 2; floor space occupied, 84″ × 56″.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DEFIANCE OHIO.
U.S.A.

No. 75 Patent D Handle Mortising and Boring Machine.

Export Shipping Weight, 2,500 Pounds.

Net Weight, 2,000 Pounds.

Cubic Measurement, 98 Feet.

Cable Word, MINTSELA.

No. 75 Patent D Handle Mortising and Boring Machine.

Export Shipping Weight, 2,500 Pounds.
Net Weight, 2,000 Pounds.
Cubic Measurement, 98 Feet.
Cable Word, MINTSELA.

THIS ENGRAVING represents our No. 75 Patent D Handle Mortising and Boring Machine designed for cutting the eye in D handles for shovels, forks and spades. It will successfully handle hard or soft, green or dry stock without steaming. It accomplishes the work smooth and true at the rate of about 3,000 handles in ten hours with an inexpensive operator to handle it. Previous to its introduction this work required four different operations, first, to steam the material to soften it, second, to do the boring, and two to do the mortising.

IT IS so constructed that the entire work is accomplished by a single upward movement of the table, as two handles are placed into the machine at one time, one in the boring, the other in the mortising departments.

THE WORKING PARTS are mounted upon a substantial iron frame of neat design, cast in one piece, with cored center and with a broad floor base to stand firm.

THE TABLE upon which the handles are held is gibbed to the front of the frame and elevated to the cutting tools by powerful gearing, driven by a friction clutch, which can be instantly started or stopped by a slight touch of the operator's foot upon the pedal at the base of the machine. The handles are gripped and firmly held between self-centering jaws true with the cutting tools, requiring no attention on the part of the operator in placing the work in the machine.

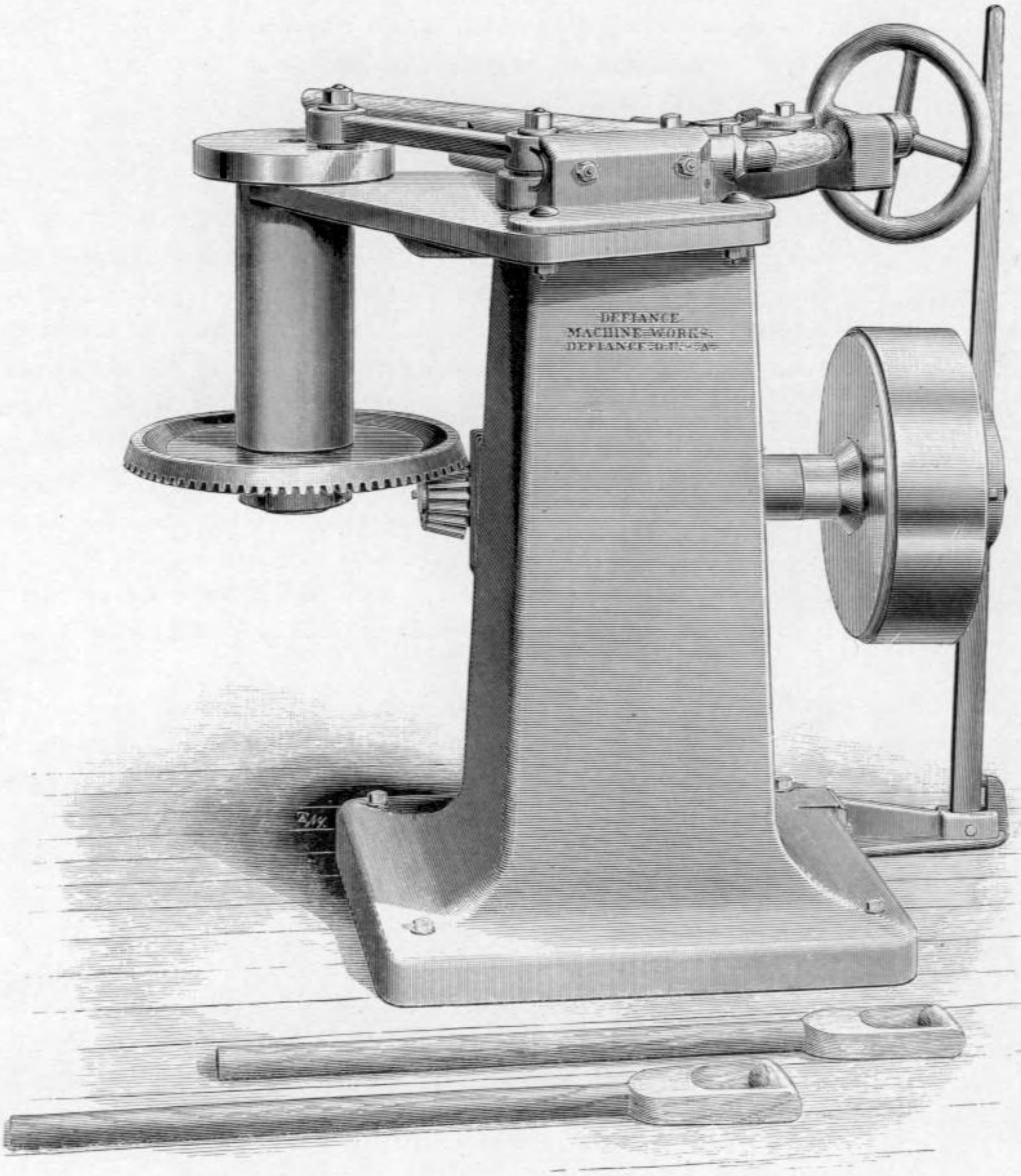
THE BORING DEVICE is fitted with one large and two small boring bits, removing as much of the stock as possible leaving a small surplus to be removed by the chisel, which is capable of cutting a smooth and true D shape hole without slivering or injuring the handle.

THE CHISEL, of new design, is made in halves and clamped together for the purpose of reducing their cost and enabling the average mechanic to produce them. It is fitted with an automatic chip removing device which discharges them through a spout underneath the table.

ALL THE BEARINGS, including the loose pulleys and idlers, of this machine are of bronze and self-lubricating, and all the gears are cut from the solid.

THE COUNTER is furnished as follows: Shaft, $1\frac{15}{16}''$ × 48″ long; two No. 2 ball and socket J drop self-oiling hangers; driving pulley, 30″ × 4″; tight and loose pulleys, 12″ × 5″; speed, 500 rotations per minute; one double loose pulley, consisting of 24″ × 5″ and 10″ × 6″, driven from the main line shaft; pulley speed, 75 rotations for lifting the table.

HORSE POWER to drive, 2; floor space occupied, 31″ × 58″.


DEFIANCE
MACHINE WORKS.
DEFIANCE O. U.S.A.

No. 1 Patent Automatic D Handle Shaping Machine.

Export Shipping Weight, 1,200 Pounds.

Net Weight, 800 Pounds.

Cubic Measurement, 40 Feet.

Cable Word, SOMBRE.

No. 1 Patent Automatic D Handle Shaping Machine.

Export Shipping Weight, 1,200 Pounds.
Net Weight, 800 Pounds.
Cubic Measurement, 40 Feet.
Cable Word, SOMBRE.

THIS ENGRAVING represents our No. 1 Automatic D Handle Shaping Machine, especially designed for rounding or shaping the outer portion of the hand hold on D handles, intended for shovels, spades, and forks.

IT IS so constructed that the entire cut or operation is performed at a single stroke of the machine, having a capacity for shaping 2,000 handles in ten hours, and doing the work true and smooth so that no hand labor is required.

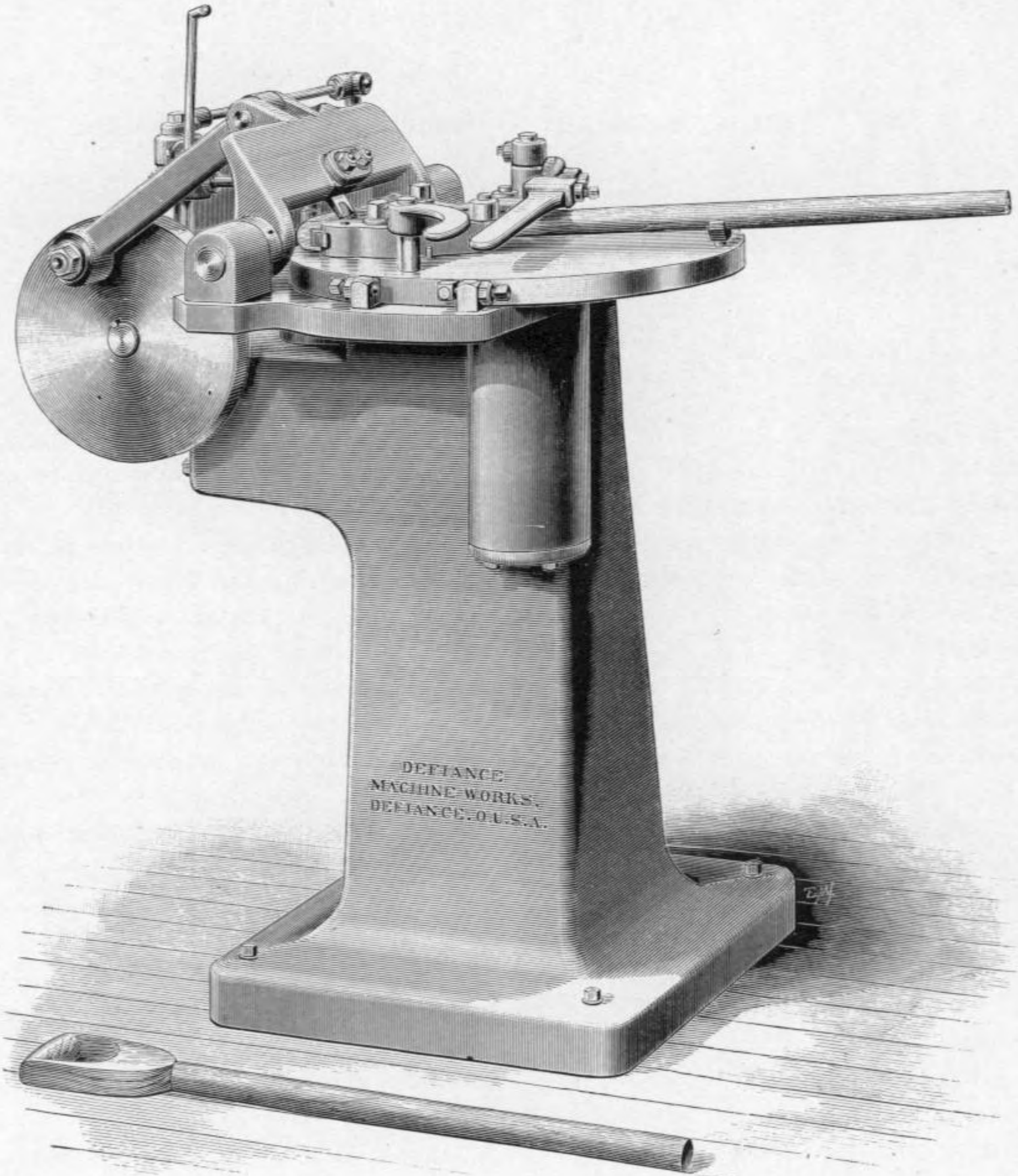
THE WORKING PARTS are mounted upon a heavy iron column of neat design, cast in one piece with cored center. By this design all tendency to twist or spring the parts out of alignment is defeated and an easy movement of the working parts is secured.

THE OSCILLATING CARRIAGE which supports the handle while being operated upon is fitted with self-centering jaws, propelled by hand screw which correctly centers and firmly holds the handle in position without any care on the part of the operator.

THE CUTTER is stationary; the carriage carrying the handle is moved to it. A single movement completes the operation. The driving mechanism consists of cut gears operated by a friction clutch which is connected by a convenient hand lever, giving the operator instant control over the movement of the carriage.

THE FRICTION DRIVE pulley is 16″ diameter, 4″ face, and should run 50 revolutions per minute; countershaft, 1 11/16″ × 42″; receiving pulley, 24″ × 4″, and driving pulley, 8″ × 4″; two No. 1 hangers; speed of countershaft, 100 turns per minute.

HORSE POWER to drive, ½; floor space occupied, 31″ × 44″.



No. 2 Patent Automatic D Handle Shaping Machine.

Export Shipping Weight, 1,200 Pounds.

Net Weight, 800 Pounds.

Cubic Measurement, 48 Feet.

Cable Word, SPANNY.

No. 2 Patent Automatic D Handle Shaping Machine.

Export Shipping Weight, 1,200 Pounds.

Net Weight, 800 Pounds.

Cubic Measurement, 48 Feet.

Cable Word, SPANNY.

THIS ENGRAVING represents our No. 2 Patent Automatic D Handle Shaping Machine, which has been designed to automatically shape or round the inside portion of the hand hold of D handles for shovels, spades, and forks. Previous to the introduction of this machine this work was accomplished entirely by hand, which was not only slow and expensive, but faulty, from the fact that a true circle could not be secured, neither was the work performed smoothly.

THIS MACHINE is provided with all the necessary adjustments to accommodate either small or large handles, and is especially recommended for the purpose of reducing the labor, increasing the capacity, and improving the quality of the work. It is so simple that it can be handled by inexpensive labor and perfect work expected of it.

THE FRAME is a substantial casting in one piece with cored center, making it stiff and reliable. The working parts are mounted upon it and are so arranged that the handle to be operated upon can be instantly gripped in a self-centering chuck to the proper position without any care on the part of the operator.

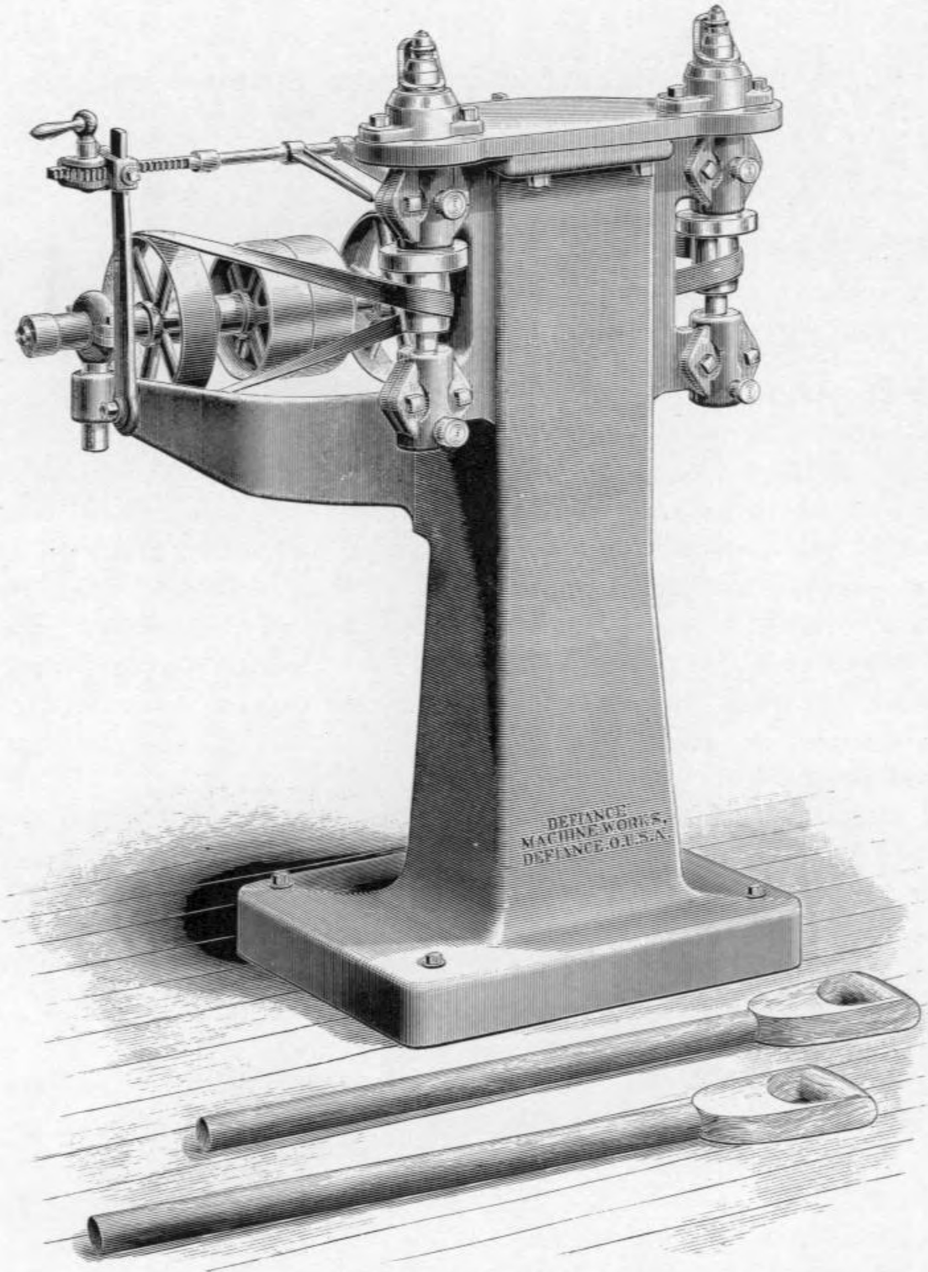
THE CUTTER BAR is driven by a friction clutch which can be instantly started or stopped, giving the operator perfect control over the machine. One cut is all that is required to finish the work, leaving neat, round corners or fillets for strength at either side. Square corners can be made if desired by simply changing the shape of the cutter.

THE CAPACITY of this machine is about 1,000 handles per day, requiring two machines to keep up with our complete system.

THE FRICTION PULLEY is 16″ diameter, 4″ face, and should run 20 turns per minute.

THE COUNTER is furnished as follows: Shaft, 1$\frac{11}{16}$″ × 42″; receiving pulley, 24″ × 4″; driving pulley, 4″ × 4″; two No. 1 hangers; speed, 100 turns per minute.

HORSE POWER to drive, ½; floor space occupied, 40″ × 42″.



No. 3 D Handle Shaping and Finishing Machine.

Export Shipping Weight, 600 Pounds.

Net Weight, 400 Pounds.

Cubic Measurement, 24 Feet.

Cable Word, SALAMANCA.

No. 3 D Handle Shaping and Finishing Machine.

Export Shipping Weight, 600 Pounds.

Net Weight, 400 Pounds.

Cubic Measurement, 24 Feet.

Cable Word, SALAMANCA.

THIS ENGRAVING represents our No. 3 D Handle Shaping and Finishing Machine, which has been designed especially for rounding or chamfering the corners of shovel, spade, and fork handles. This portion of the work had previously been performed by hand with a draw shave, which proved objectionable as well as a very slow and expensive process, and rarely, indeed, was it possible to produce the work on two handles alike.

BY THIS NEW MACHINE and an inexpensive operator, 1,000 handles can be successfully finished in ten hours, with neat, beveled corners, each to exact size and shape, so smooth and perfect that no hand labor is required.

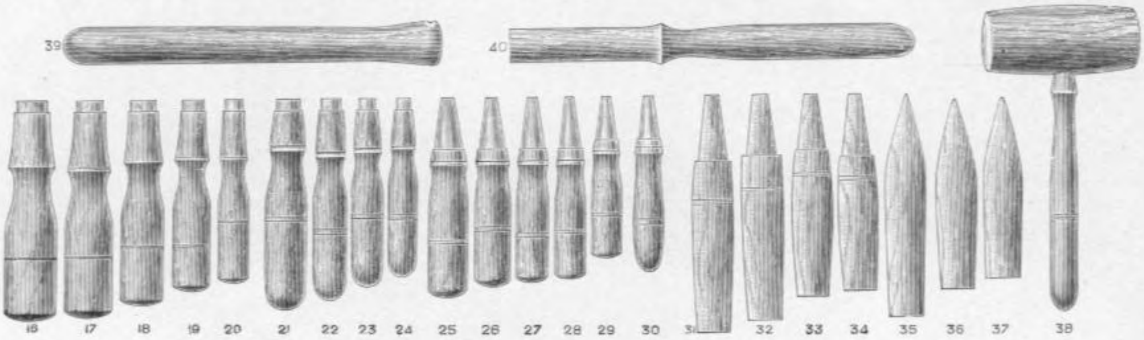
THE FRAME, of iron, is cast in one piece with cored center, with a broad floor base. It is of neat design and the machine is entirely self-contained.

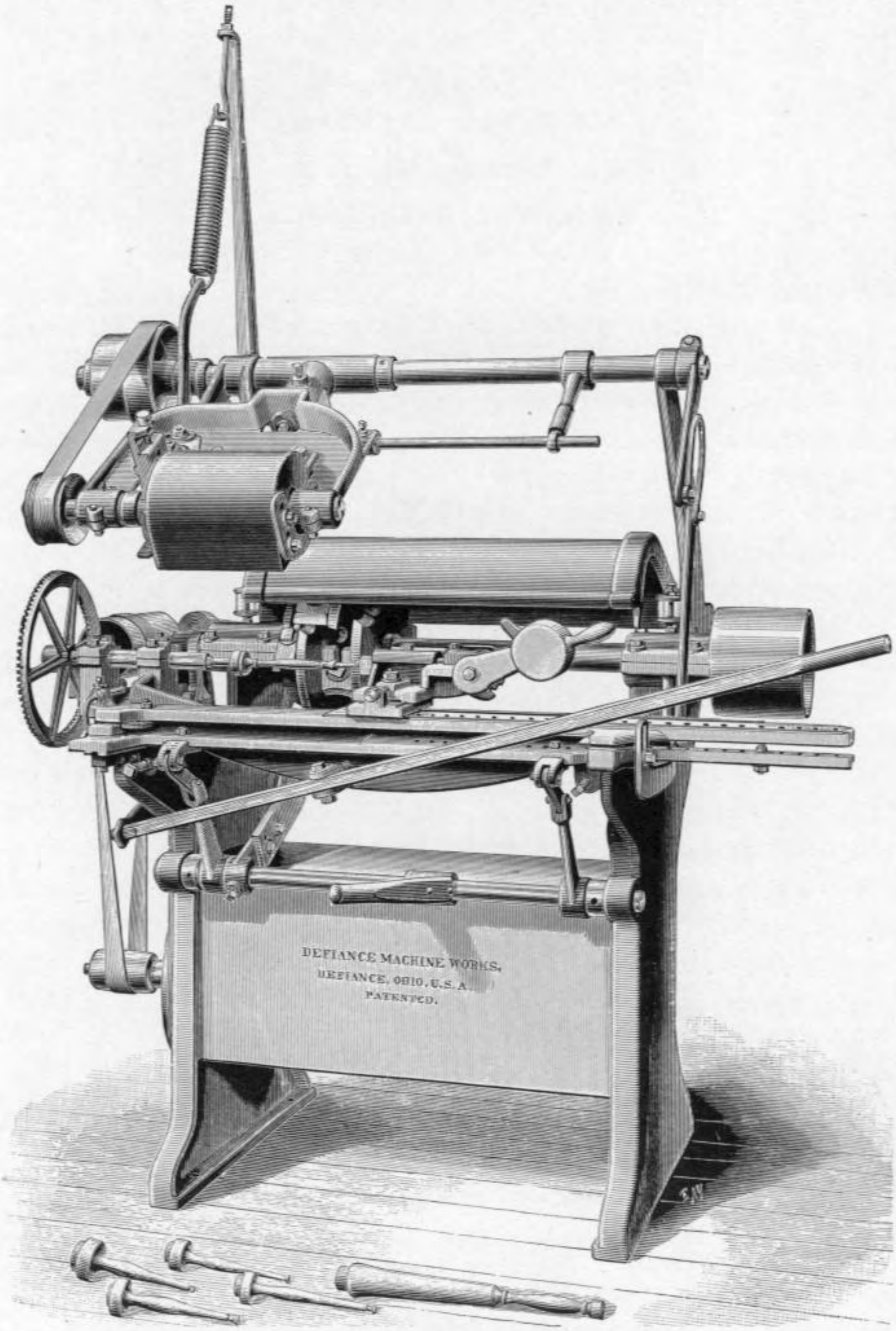
THE CUTTER HEAD SPINDLES, of steel, run in genuine babbitt metal, self-oiling bearings. The cutters, of an improved kind, will cut clean and smooth without tearing, and they are covered with a shield to protect the operator.

THE HANDLE TO BE OPERATED UPON is held in the hands of the operator throughout the entire process. The cutters are provided with guides to regulate the depth of cut, and every portion of the handle necessary to dress can easily be reached by swinging the handle to the required position.

THE COUNTER is attached to the rear of the machine and equipped with belt shipping apparatus. The tight and loose pulleys are 6″ in diameter and 2″ face, and should run 1,500 rotations per minute.

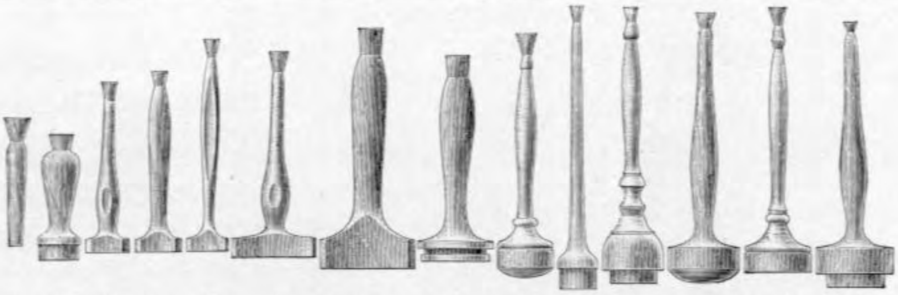
HORSE POWER to drive, ½; floor space occupied, 26″ × 31″.





24″ Patent Automatic Handle Lathe.

Export Shipping Weight, 2,900 Pounds.
Net Weight, 2,400 Pounds.
Cubic Measurement, 97 Feet.
Cable Word, LIVELY.



24″ Patent Automatic Handle Lathe.

Export Shipping Weight, 2,900 Pounds.
Net Weight, 2,400 Pounds.
Cubic Measurement, 97 Feet.
Cable Word, LIVELY.

THIS MACHINE has been designed for rapidly turning brush and tool handles similar to those shown by the engravings, Nos. 16 to 54, having a capacity of 3,000 to 3,500 handles per day.

IT RECEIVES the rough material, either hard or soft wood, and performs the turning complete at one operation, making each piece of a kind to exact size and shape, turning round, oval, hexagon, octagon, or square, as may be desired, in the most delicate sizes up to 6″ diameter and 24″ long.

THE MAIN FRAME supporting the working parts is of iron with cored center, and it is very stiff and reliable.

THE CUTTER HEADS are fitted to a 2¼″ steel spindle running in long, genuine babbitt metal bearings, and they are equipped with knives having cutting edges to correspond with the shape of the work to be turned; a sufficient number of heads are employed to cover the entire length of the piece to be turned; the heads and knives are numbered, so that in changing from one class of work to another it can be quickly accomplished.

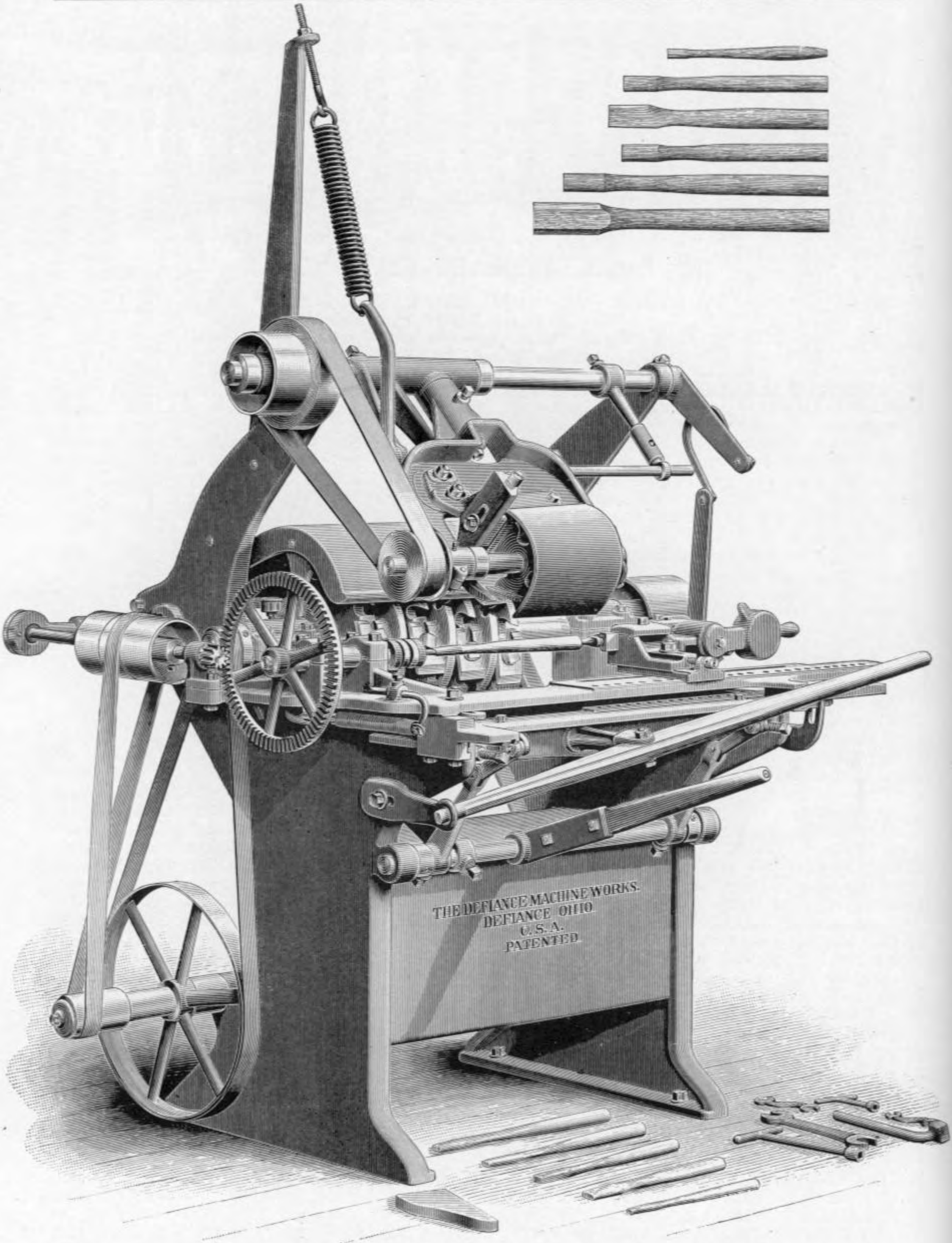
THE TABLE is adjustable in a most ingenious and useful manner. It is constructed in two parts, forming a double table. The lower half rests upon the main frame in angle ways and is gibbed to it. The upper part, upon which the centers are mounted, is pivoted to the lower half by a steel pin in one of the several holes through the tables upon which it oscillates, when performing oval turning; at the opposite end on the head center spindle an inexpensive cast iron cam or form is placed of proper shape to suit the style of work to be turned; this cam revolves against an upright shoe extending up from the lower table, and they are held together by a coiled spring. A convenient hand lever is used for sliding the table to and from the cutter heads. When advancing to the cutter heads at a point where the turning shall begin, the material to be turned is slowly revolved by an automatic feed; at the same time the upper table is oscillated in a path corresponding with the shape of cam or form and the material between the centers is turned the same shape as the cam. When the pivot which connects the tables is placed directly opposite the tail center, the machine will turn the material round at the center of oscillation and to the shape of the cam at the opposite end. In turning the same shape at both ends of the work, either round or irregular, the tables are locked together, and, by the aid of a second cam shoe attached to the main frame of the machine, both ends of the table may be oscillated alike. The diameter of turning can be varied from ¼″ to 6″ by simply adjusting two screws underneath the table.

THE TAIL CENTER is adjusted by loosening a single screw the desired distance from the head center for short or long turning, and it is provided with a transverse right angular adjustment with the table for doing taper turning.

THE SWINGING CUTTER HEAD is no less effective than ingenious. It advances and retreats from the work in an automatic manner; its position being controlled by the movement of the table, it is brought down to its work simultaneously with the beginning of the turning and when the table is moved backward to remove the turned material from the centers the cutter head is lifted out of the way by a spring balance. Its action upon the turning is controlled by a second cam or form placed upon the head center spindle, and it will faithfully follow the path of any shaped cam placed into the machine, either round, oval, hexagon, octagon, or square, its purpose being to turn and finish the eye end of handle when its shape differs from the body or the handle end; necessary adjustments are also provided to turn with it parallel or tapering in either direction and in varying diameters.

TIGHT AND LOOSE PULLEYS, 14″ × 6″; speed, 600 rotations per minute.

HORSE POWER to drive, 3½; floor space occupied, 38″ × 66″.


THE DEFIANCE MACHINE WORKS.
DEFIANCE OHIO
U.S.A.
PATENTED

24″ Patent Automatic Hammer and Hatchet Handle Lathe.

Export Shipping Weight, 2,900 Pounds
Net Weight, 2,400 Pounds.
Cubic Measurement, 97 Feet.
Cable Word, LUNUM.

24″ Patent Automatic Hammer and Hatchet Handle Lathe.

Export Shipping Weight, 2,900 Pounds.

Net Weight, 2,400 Pounds.

Cubic Measurement, 97 Feet.

Cable Word, LUNUM.

THIS ENGRAVING represents our 24″ Patent Automatic Hammer and Hatchet Handle Lathe, especially designed for rapidly and accurately producing hammer and hatchet handles. It takes the rough stock and completes the work at the rate of about 3,000 handles in ten hours, with an inexpensive operator. It receives the handle blank, after it has been equalized to length, and performs the turning and the finishing of the eye end of the handle complete at one and the same time; it does its work so smooth that little, if any, finishing is required, and it turns the work to exact size and shape, turning the body of the handle round or oval, making the eye end round, oval, square, flat, six or eight sided, either straight or tapering, with quick adjustments to turn the various diameters and lengths, accommodating work up to 24″ long and any sizes under.

THE FRAME is a heavy casting with cored center. It is strong and substantial to properly support the working parts, and it is provided with a broad base to stand firm.

THE CUTTER HEAD SPINDLE, of steel, 2¼″ diameter, rotates in long, self-lubricating bearings. The bearing at the right hand end is removable. It is fitted to the top of the frame in planed angle ways, and locked in position by a single bolt. By slipping off the pulley and the box, and throwing back the hood which surrounds the cutter heads, free access is given to the cutter heads, so that they can be placed on or off the machine without removing the spindle. This new method enables the heads to be changed on the machine in a few moments time, for different kinds of handle turning.

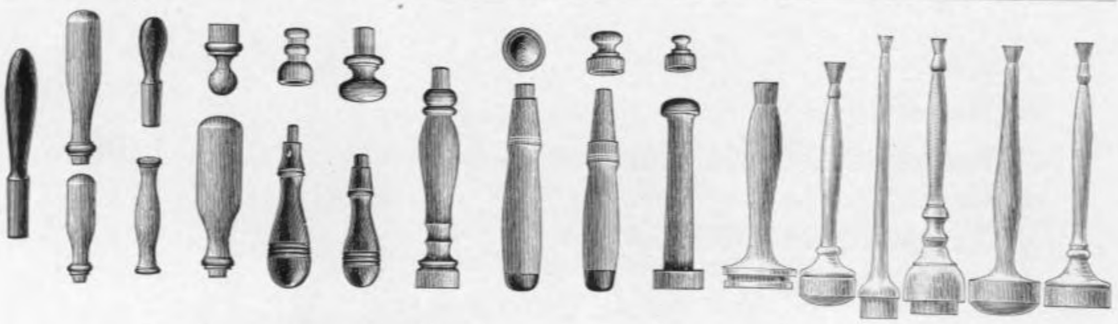
THE CUTTER HEADS each contain three shear-cutting knives, which cut perfectly smooth, entirely free from knife marks, and a sufficient number of heads are used to cover the entire length of turning, so that the entire handle is turned at one and the same time. All the heads are numbered so that they can be properly placed on the spindle without loss of time. A chart is furnished with the lathe, showing the correct position of each head on the spindle.

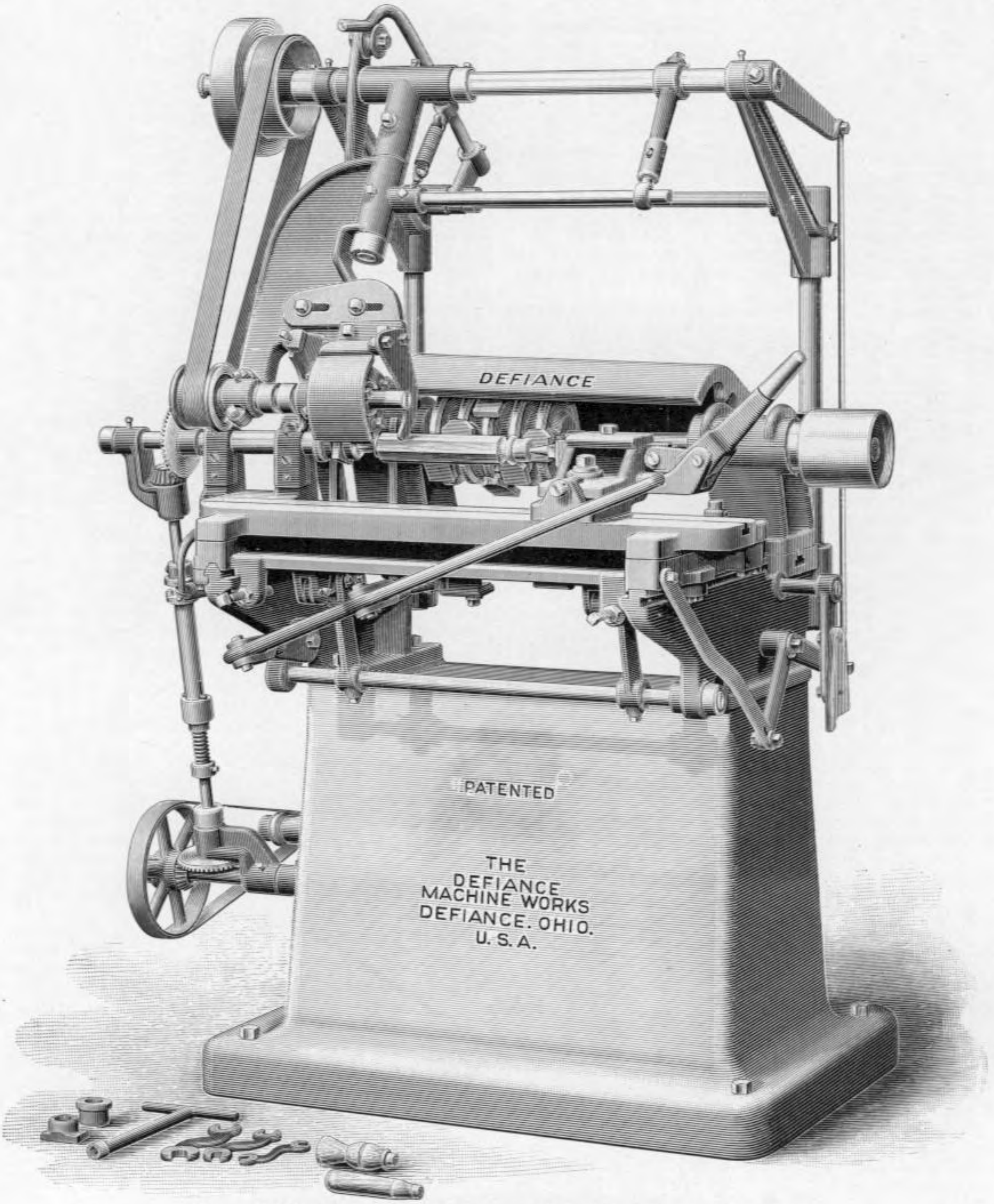
THE TABLE supporting the work is fitted to the top of the frame in planed angle ways, and thoroughly gibbed in position, and it moves to and from the cutters by a convenient hand lever. Adjusting stops at each end underneath the table regulate the diameter of the handle to be turned. The tail center has a horizontal adjustment to and from the spur center to accommodate the length of work. It is also provided with a right angular adjustment to turn the work straight or to any taper. To the spur center spindle, two cams or governing models are attached. One governs the shape of the body of the handle, and the other the eye end. These cams are attached to the spindle by a single screw, and they can be quickly placed on or off. An assortment is furnished for the various shapes of handles.

THE SWINGING CUTTER HEAD is calculated to shape the eye end of the handle. It advances and retreats from the work in an automatic manner. Its position is controlled by the movement of the table. It comes down and completes its work when the table is moved towards the cutters. The handle is then turned and the eye end finished to the shape of the cams or governing models used. Both portions are completed at the same time. The handle is automatically rotated against the cutters; two or three turns complete the work, after which the table is moved back for the removal of the finished product, at the same time the swinging cutter head is automatically lifted up out of the way, and the feed arrested, when another handle blank is inserted, and the operation repeated.

THE COUNTER is furnished as follows: Shaft, 2$\frac{3}{16}$″ × 72″; two No. 2 ball and socket adjustable drop hangers, with improved belt shipping apparatus attached; one driving pulley, 30″ × 6″, for cutter head spindle; one driving pulley, 18″ × 3″, for swinging cutter head; the tight and loose pulleys are 14″ × 6″, and should run 640 turns per minute. The pulley on the cutter head spindle is 8″ × 6″; speed, 2,400 turns per minute.

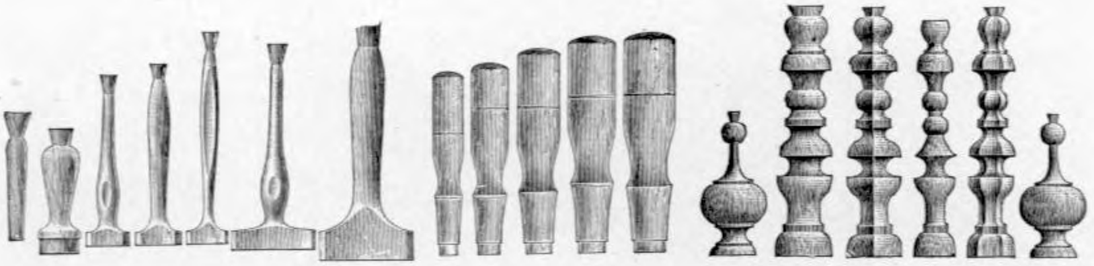
HORSE POWER to drive, 3½; floor space occupied, 38″ × 66″.





No. 444 Patent Automatic Turning Lathe.

Export Shipping Weight, 1,900 Pounds.
Net Weight, 1,400 Pounds.
Cubic Measurement, 74 Feet.
Cable Word, LEBIR.



No. 444 Patent Automatic Turning Lathe.

Export Shipping Weight, 1,900 Pounds.
Net Weight, 1,400 Pounds.
Cubic Measurement, 74 Feet.
Cable Word, LEBIR.

THIS MACHINE has been especially designed for a large class of delicate work within a range of 16″ in length and down, to a lesser diameter than heretofore attempted by this method of turning.

IT INCLUDES in its list, chisel handles, file handles, screw driver handles, in oval, flat, polygonal and round, carving tool handles, awl handles and brush handles of all sizes and variations demanded by the market in those objects. It will turn up to 3″ or 4″ in diameter and will therefore include the samples shown above and many others. It will turn these forms in any polygonal section desired, triangular, square, hexagonal, octagonal, oval, or round and in combinations of square and round. It will turn umbrella handles of the modern lance style in any transverse section desired; knife handles in round, rectangular, oval or flat section, to the smallest size demanded; artificial trolling minnows and like objects. It will turn all shapes of small balusters, ornamental spindles, knobs, terminals and hundreds of objects that cannot here be enumerated.

ALL PARTS OF THE MACHINE subject to quick movement are made sensitive and delicate enough to respond promptly to the will of the operator and produce good work; while the stationary and supporting parts are made exceptionally heavy and stable, for the purpose of reducing tremble and vibration to the smallest possible limit. All journal bearings are of bronze. The boxes for the main cutter head spindle are provided with both automatic oilers and oil cellars, together with sediment drains.

THE UPPER AND LOWER TABLES, which constitute the carriage for holding the piece to be turned, are gibbed to each other and to the frame; and the upper table is susceptible of an oscillating movement in obedience to a cam. By this means a stick may be turned polygonal at one end and gradually merged into a round section at the other; thus making a pleasing ornamental object. Or, the stock may be turned either polygonal or round the whole length according to adjustments at the will of the operator. Objects may be turned tapering from right to left, or from left to right, or parallel, without change of equipment.

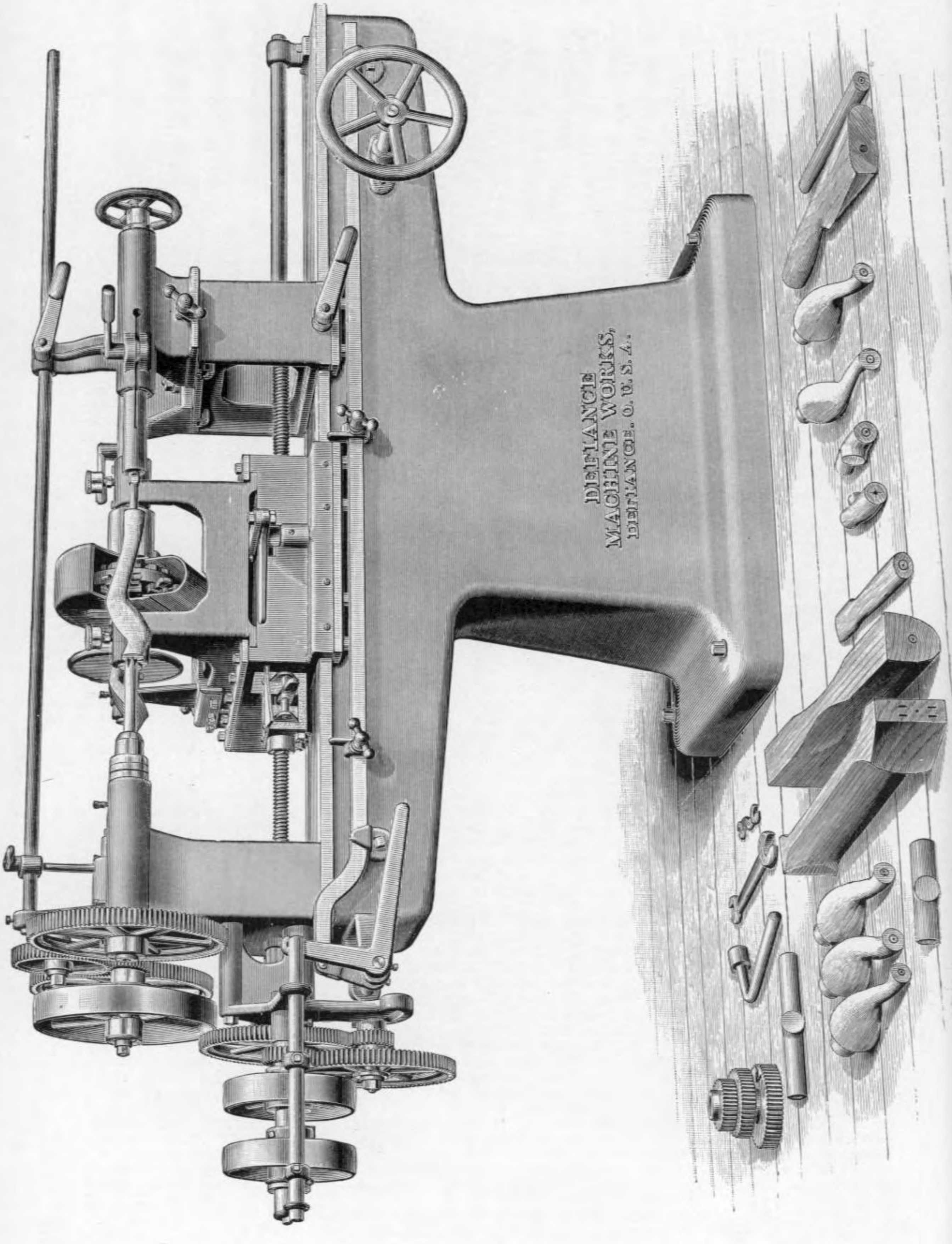
THE SWINGING FRAME carries an auxiliary cutter head for forming the ends of objects to different shapes, sizes and sections from the main parts, and its movements are guided by a cam of its own. The action of this frame is automatic in advancing and retreating, after being adjusted to its purpose. It may also be used to contribute much to the beauty of ornamental forms and also to insure the correct fitting of the eye ends of handles. It may be swung out of the way when not needed.

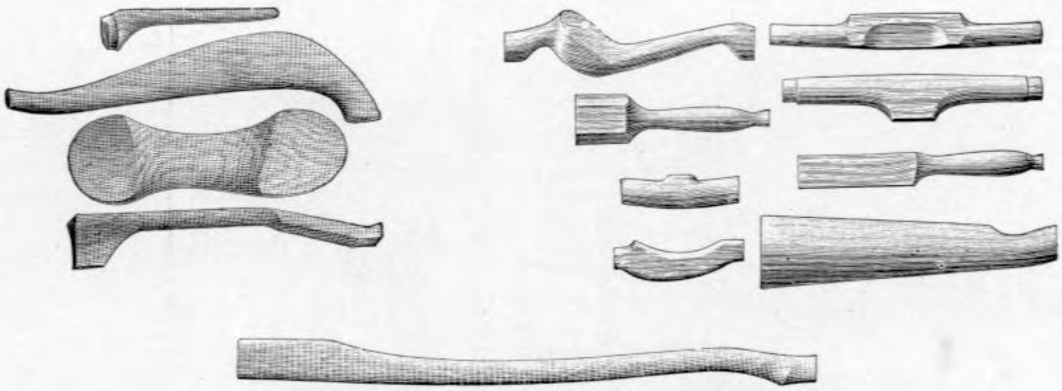
WE HAVE NAMED but a few of the possibilities of producing useful and pleasing forms and ornamental designs. Much depends on the skill and ingenuity of the operator in effecting combinations and symmetrical shapes, and when interest is once enlisted the capabilities appear infinite. This is the latest evolution in this class of machines, which, in our hands, have met and absorbed all competition throughout a period of forty years.

WE ARE PREPARED at any time to furnish designs for ornamental work, best adapted to suit the requirements of this class of turning, and at the same time to suit the most exacting artistic demands, if our patrons will describe to us the sizes of objects sought and the positions they are to occupy. Our experience has been such as to enable us to save the patron much time and perplexity.

TIGHT AND LOOSE PULLEYS, 10″ × 5″; speed, 800 turns per minute.

HORSE POWER to drive, 3; floor space occupied, 38″ × 48″.


DEFIANCE
MACHINE WORKS,
DEFIANCE. O. U. S. A.



No. 0 Patent Automatic Copying Lathe.

Export Shipping Weight, 2,700 Pounds.

Net Weight, 2,100 Pounds.

Cubic Measurement, 108 Feet.

Cable Word, LIHUNG.

THIS ENGRAVING represents our No. 0 Patent Automatic Copying Lathe, which has been designed for accurately turning irregular shapes such as ax handles, hames, side bars for saddles, hat blocks, golf stick heads, gunstocks, handles, spokes, and other wooden articles from the most delicate sizes up to 42″ long, and finish various diameters up to 6″ at the largest. It will reproduce an exact facsimile of any model placed into the machine. In addition to this, either end of the product may be made larger or smaller than the governing model by a simple, quick adjustment of the machine. At an extra cost, and when especially ordered, it can be furnished with an attachment to turn both rights and lefts accurately from one model.

THE FRAME is a heavy casting of neat design, cast in one piece, with cored center and a broad floor base to stand firm.

THE HEAD SPINDLES to revolve the work to be turned and the model are fitted into long connected bearings, and they are driven by cut gearing, which insures a uniform motion and secures perfect turning.

THE TAIL SPINDLES stand opposite and in alignment with the head spindles, and they are adjustable horizontally together for work of various lengths with an independent horizontal adjustment by hand wheel and screw to place in and take out the work and model. They also have a right angular adjustment to change the size of turning at either end.

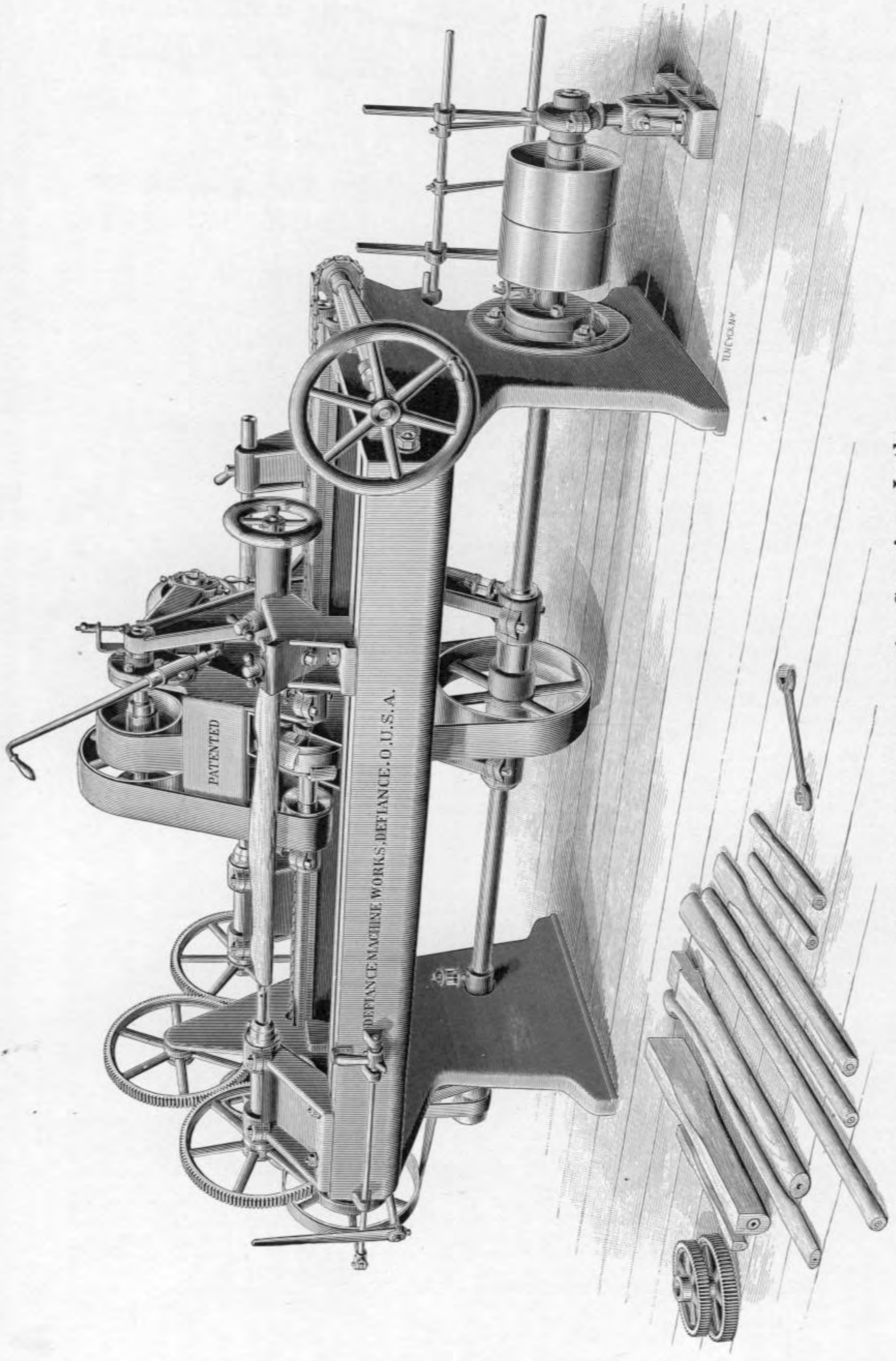
THE CUTTER HEAD CARRIAGE is accurately fitted and thoroughly gibbed to the main frame. It is traversed across the path of the material to be turned by means of a heavy screw driven by a double friction to feed from left to right and from right to left, starting to turn the material at either end. The frictions are automatically engaged or disengaged for starting or stopping the feed. The frame supporting the cutter head and guide roller is gibbed to the carriage and it vibrates in a path that corresponds with the shape of the model placed into the machine, and it is connected by a convenient hand lever to bring the cutter head up to its work or throw it back out of the way, which can be accomplished while the machine is in motion.

THE CUTTER HEAD is fitted with right and left hand cutters to feed both ways, and it is so constructed as to successfully turn either hard or soft wood, and produce smooth and satisfactory turning.

THE FEEDING MECHANISM is so constructed to turn, with the carriage feeding from left to right or from right to left, alternately, or it may be adjusted so as to feed in one direction only, and have the carriage returned by a quick automatic motion to the place of starting, and the starting station may be at the right or left hand end of the machine, as desired. It has five changes of feed from $\frac{1}{8}''$ to $\frac{3}{8}''$, varying $\frac{1}{16}''$ to each revolution of the work turned, and it can be started or stopped instantly. Adjustable stops are provided on a horizontal bar under the carriage for regulating the length of travel to the cutter head and they can be instantly set for short or long turning. When the end of cut is reached, the feed is automatically disengaged ready for the next cut.

THE COUNTER is furnished as follows: Three No. 1 ball and socket adjustable drop hangers, with new style belt shipping apparatus; one countershaft, $1\frac{7}{16}''$ × 90″; one drum for driving the cutter head, 16″ × 44″. The tight and loose pulleys are 8″ × 4″ and should run 625 turns per minute.

HORSE POWER to drive, $1\frac{1}{2}$; floor space occupied, 34″ × 86″.


PATENTED
DEFIANCE MACHINE WORKS, DEFIANCE. O. U.S.A.

No. 1 Patent Automatic Copying Lathe.

Export Shipping Weight, 4,500 Pounds.
Net Weight, 3,300 Pounds.
Cubic Measurement, 225 Feet.
Cable Word, LAKE.

No. 1 Patent Automatic Copying Lathe.

Export Shipping Weight, 4,500 Pounds.
Net Weight, 3,300 Pounds.
Cubic Measurement, 225 Feet.
Cable Word, LAKE.

THIS ENGRAVING represents our No. 1 Patent Automatic Copying Lathe, designed for turning from patterns all kinds of irregular shapes, such as hammer, hatchet, railroad and mining pick handles, gunstocks, spokes, neck-yokes, single-trees, and various other articles, turning work up to 8″ diameter, down to the smallest sizes, and up to 48″ long and anything shorter. It is constructed from entirely new designs, and it embraces important labor-saving features found in no other copying lathe. Its great strength and accuracy in workmanship renders it capable of increasing the quantity and improving the quality of its product. It is an exact facsimile lathe, reproducing work according to the pattern used.

THE FRAME of this machine is a heavy casting, with cored center, and broad floor base to stand firm.

THE CUTTER HEAD is fitted to a heavy steel spindle, running in long self-lubricating bearings attached to a vibrating frame on the carriage, which is traversed upon planed angle ways across the path of the material to be turned, by means of a heavy screw driven by cut gears, provided with three changes of speed to suit the various kinds of work. The hand lever, extending upward from the carriage, is used to bring the cutter head up to its work, or lock it back out of harm's way, when not in use. It will be observed that the knives cut on the under side of the material, discharging the chips downward out of the way, and overcoming any liability of injury to the operator.

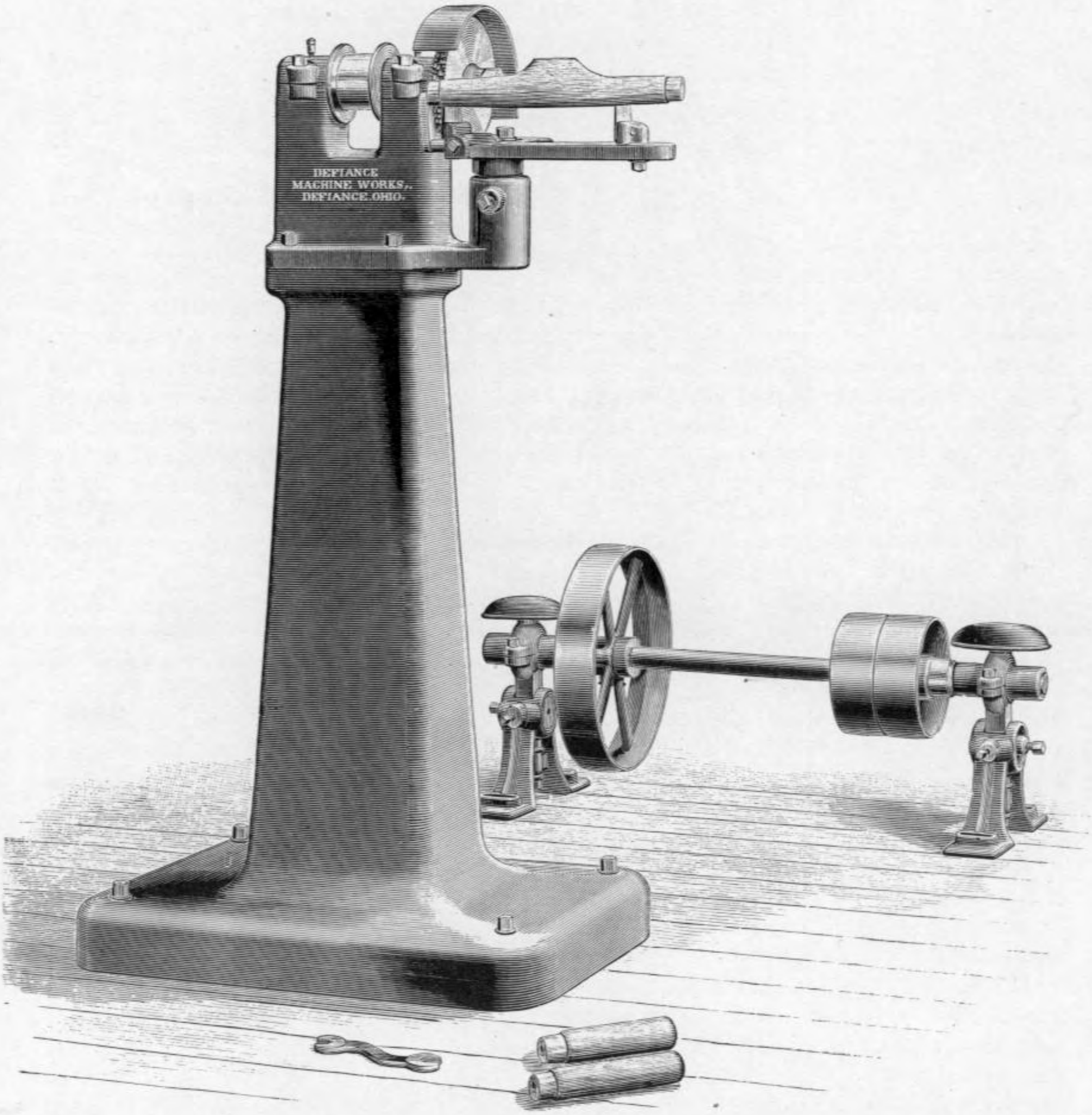
THE TAIL STOCK is fitted to the frame in planed ways, and provided with a horizontal adjustment to or from the spur center for short or long turning. It also has a right angular adjustment to change the diameter of turning at either end.

THE PATTERN which governs the vibrating path of the cutter head is placed between the centers at the rear of the machine, which can also be adjusted quickly for patterns of various lengths. The pattern should be an exact duplicate of the shape of the work desired to be turned, but the machine has an adjustment whereby the size of the article to be turned may be varied either smaller or larger than the governing model.

THE FEED is very powerful, with three changes of speed, and automatic in its action, stopping instantly when the end of cut is reached, or it may be arrested at any point desired, while the machine is in motion. It is provided with a quick adjustment, so that the carriage will traverse forward and backward to suit the exact length of the work to be turned. It will feed from left to right or from right to left, consequently the turning may begin at either end of the material, which effects a large saving in time.

THE COUNTER is a part of the machine. The tight and loose pulleys are 10″ diameter, 5″ face, with the loose pulley fitted with bronze bearings, and they should run 430 turns per minute.

HORSE POWER to drive, 4; floor space occupied, 54″ × 96″.



No. 1 Ferrule Seat Shaping and Boring Machine.

Export Shipping Weight, 500 Pounds.
Net Weight, 350 Pounds.
Cubic Measurement, 9 Feet.
Cable Word, FANTAN.

No. 1 Ferrule Seat Shaping and Boring Machine.

Export Shipping Weight, 500 Pounds.
Net Weight, 350 Pounds.
Cubic Measurement, 9 Feet.
Cable Word, FANTAN.

THIS ENGRAVING represents our No. 1 Ferrule Seat Shaping and Boring Machine, designed for the purpose of cutting ferrule seats on the end of handles and other wooden articles and boring the hole in the end for the reception of the tool. Both operations are performed quickly and accurately at one handling.

IT WILL cut the ferrule seats, or tenons, round, oval, square, hexagon, or octagon, either straight or tapering, with square or round shoulders, in various lengths and diameters, making the ferrule fit neatly, and bore the hole truly in the center to the desired depth and size, and other classes of work such as pointing, removing the stub ends as left by the turning lathe, cutting slots in the end of knife and saw handles, etc. All the adjustments of this machine can be quickly and easily made.

THE FRAME of this machine is exceedingly well designed and it is cast in one piece, with cored center and a broad floor base to stand firm, with the working parts accurately fitted to it.

THE CUTTER SPINDLE, of steel, runs in substantial self-lubricating bearings with the driving pulley between them. The cutters consist of a number of saws clamped together between suitable collars with a steel nut. The center of the spindle is provided with a small universal chuck to hold the boring bit. This is the equipment furnished for ferrule seating and boring. Special work would require special saws and tools.

THE TABLE supporting the work is so constructed to properly hold work of almost any shape. Adjustable stop gauges are provided to regulate the length and diameter of cut. The work is placed into the machine as shown, and revolved against the cutters by hand, a single rotation finishing the same. The boring is next performed by placing the work in the self-centering device provided for that purpose. This machine can be handled successfully by the cheapest labor.

THE COUNTER is furnished as follows: Two No. 0 ball and socket adjustable drop hangers; shaft, 1 3/16″ × 30″; one driving pulley, 12″ × 2″; tight and loose pulleys, 6″ × 2″; speed, 800 turns per minute.

HORSE POWER to drive, ½; floor space occupied, 24″ × 36″.